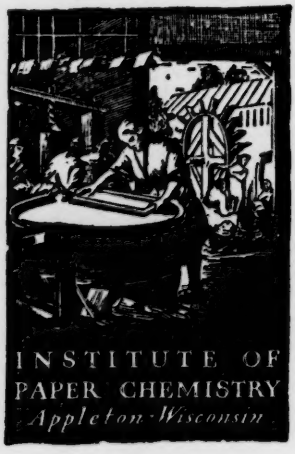
Pages 691-778

BULLETIN

OF

THE INSTITUTE OF PAPER CHEMISTRY



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LAWRENCE COLLEGE

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LIBRARY NOTES

MAY · 1954
Volume 24 Number 9

THE cut on the cover is a reproduction of the Bookplate of The Institute of Paper Chemistry. The drawing, entitled, "the Papermaker," first appeared in 1698 in the Book of Trade by Christoff Weigel. This particular reproduction has been copied from an illustration appearing on page 43 of Dard Hunter's book "Papermaking Through Eighteen Centuries," published in New York in 1930 by William Edwin Rudge. THE INSTITUTE is greatly indebted to Mr. Hunter for permission to use the illustration.

Through an unfortunate error the following line was omitted on page 614 of the preceding issue, volume 24, no. 8, under "Color-blindness":

BREWER, W. LYLE. Fundamental response functions and binocu-

MAY • 1954
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LIBRARY NOTES

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Books and Pamphlets Added to the Library During April

ASBESTOS

FRANK, KARL. Asbest. 2. umgearb. u. erw. Aufl. Hamburg, Becker & Haag, 1952. 234 p.

CHEMISTRY, ANALYTIC—QUALITATIVE

FEIGL, FRITZ. Spot tests. Translated by Ralph E. Oesper. 4th compl. rev. English ed. New York, etc. Elsevier, 1954. v. II. Organic applications. 436 p.

CHEMISTRY, ORGANIC

BEILSTEIN, FRIEDRICH KONRAD. Beilsteins Handbuch der organischen Chemie. 4. Auflage. Zweites Ergänzungswerk, die Literatur von 1920-1929 umfassend, herausgegeben und bearbeitet von Friedrich Richter. Berlin, etc., Springer-Verlag, 1954. 23. Band. 535 p.

CORROSION AND ANTI-CORROSIVES

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. *Chemical Engineering Committee. Digester Corrosion Subcommittee.* Inspection of digesters. TAPPI monograph series no. 12. New York, The Association, 1954. 183 p.

EDUCATION, HIGHER

U. S. OFFICE OF EDUCATION. Education directory, 1952-53. Part 4. Education associations. [Prepared by Margaret M. Butler. Washington, U. S. Govt. Print. Off., 1953] 55 p.

FLUID MECHANICS

SHAPIRO, ASCHER H. The dynamics and thermodynamics of compressible fluid flow. New York, Ronald Press [c1953] v. 1. 647 p.

HARD WOODS

EYRE, F. H., and ZILLGITT, W. M. Partial cuttings in northern hardwoods of the Lake States; twenty-year experimental results. U. S. Dept. of Agriculture. Technical bulletin no. 1076. Washington [U. S. Govt. Print. Off.] 1953. 124 p.

HUMIDITY

U. S. WEATHER BUREAU. *Technical Investigations Section.* Relative humidity—psychrometric tables, Celsius (centigrade)

temperatures. Rev. ed. Washington [U. S. Govt. Print. Off.] 1953. 32 p.

MECHANICS

GOLDSTEIN, HERBERT. Classical mechanics. Cambridge, Mass., Addison-Wesley Publ. Co. [1950, 3d printing 1953] 399 p.

OILS AND FATS

ECKEY, E. W. Vegetable fats and oils. With a chapter by Lawrence P. Miller. New York, Reinhold, 1954. 836 p.

PAINT

VON FISCHER, WILLIAM, and BOBALEK, EDWARD G., ed. Organic protective coatings. New York, Reinhold, 1953. 387 p.

PAPER—PERMANENCE

U. S. NATIONAL BUREAU OF STANDARDS. Protective display lighting of historical documents; a report by the National Bureau of Standards to the Library of Congress. National Bureau of Standards circular 538. Washington, U. S. Govt. Print. Off., 1953. 8 p.

PAPER MAKING AND TRADE—HISTORY

GÜNTHER, ERNST, and FRANZ, GÜNTHER. Die Papiermühle und die Papiermüller im Göltzschtal bei Greiz. Dreihundertsechzig Jahre im Dienste der deutschen Papiermacherei. Darmstadt, Verein der Zellstoff- und Papier-Chemiker und -Ingenieure, 1953. 108 p.

MICHAELIS, E., & Co., *Hamburg*. Der Mensch und das Papier. Hamburg, The Company, 1954. 50 p.

THIEL, VIKTOR. Geschichte der Papiererzeugung im Donauraum; ein Beitrag zur Geschichte deutscher Leistung. Biberach an der Riss, Güntter-Staib Verlag, 1940. 189 p. + 3 maps.

PAPER SPECIALTIES

STOLZE, FRITZ. Druckpapiere, ihre Herstellung und Verarbeitung. Halle (Saale), Wilhelm Knapp, 1951. 98 p. + 19 samples.

PULP

SCHWENZON, KONSTANTIN. Erzeugung von Zellstoff. Halle (Saale), Wilhelm Knapp, 1953. 124 p.

RESEARCH

AMERICAN MANAGEMENT ASSOCIATION. New solutions to production problems. Manufacturing management series number 200. New York, The Association [c1952] 28 p.

AMERICAN MANAGEMENT ASSOCIATION. Planning for efficient production. Manufacturing series number 206. New York, The Association [c1953] 38 p.

TURBULENCE

BATCHELOR, G. K. The theory of homogeneous turbulence. Cambridge, Univ. Press, 1953. 197 p.

WOOD WASTE

NORTHEASTERN WOOD UTILIZATION COUNCIL. The use of wood chips in agriculture; report of conference at Syracuse, New York, October 9, 1953. Bulletin no. 41. New Haven, The Council, 1954. 96 p.

Survey of Periodical Articles

The following are abstracts of opinions expressed by writers in the technical journals. The Institute of Paper Chemistry takes no responsibility for the opinions here summarized.

AIR CONDITIONING

LATHAM, CHARLES W. How much does air conditioning cost? Am. Printer 135, no. 4: 34-5, 58, 60 (April, 1954); *cf.* B.I.P.C. 24: 601.

Some of the important factors upon which the cost of installing, operating, and maintaining an air-conditioning system depends are discussed; of particular importance in addition to the structure of the plant are the heat load of workers and the geographical location of the plant. The amount of air conditioning required must be decided; although 40% R.H. is a preferable condition, a compromise of 50% in the summer is efficient and may save a great deal in expense. A comparison of the cost of air conditioning with losses caused by waste, spoilage, and discomfort should decide the relative value. R.A.S.

REA, T. H. Relative humidity—its control in the pressroom. Printing Equip. Engr. 84, no. 7: 35-7 (April, 1954).

The author discusses the causes of wintertime low humidities in pressrooms, which vary with the outside temperature. The low humidity causes static accumulations on the presses, and changes in R.H. produce variations in sheet size, wavy edges, and tight edges. These troubles can be eliminated by controlling the R.H. at or slightly above the 50% level. Steam humidification of pressrooms, with particular reference to the Armstrong steam humidifier, has proved satisfactory for this purpose. 2 tables and 2 figures. E.S.

ALKALINE PROCESSES

BLAND, D. E., and BATTERHAM, AUDREY. Delignification of the wood of *Eucalyptus regnans* F. Muell. by sodium hydroxide and by sodium sulphide. Australian J. Appl. Sci. 5, no. 1: 41-50 (March, 1954).

The progress of delignification of the wood of *Eucalyptus regnans* F. Muell. with 0.5 *N* sodium hydroxide and with 0.5 *N* sodium sulfide has been followed at 130, 150, and 170°C. The effect of concentration of each of the agents on the progress of the delignification at 150° has also been investigated. Sodium hydroxide acted about twice as fast at 150° as at 130° and about twice as fast at 170° as at 150°. The sulfide acted more rapidly than the hydroxide, but the effect of temperature on its action was not as great, although increase in concentration accelerated the action of the sulfide more than that of the hydroxide. With either agent substantially the same pulp could be prepared under a variety of cooking conditions. The sulfide removed lignin slightly more selectively than did the hydroxide. Experiments with sawed "chips" of different shapes showed that grain direction had no effect on the removal of lignin by sodium hydroxide but that under the conditions of this experiment there was some preferential removal by the sulfide in the longitudinal direction. 1 table, 6 diagrams, and 13 references. E.S.

ALKALINE PROCESSES—FURNACES

GAMBLE, ROBERT. Pakistan pulp mill installs liquor recovery unit of most recent design. Paper Ind. 36, no. 1: 52-4 (April, 1954).

The details of the recovery furnace and boiler unit of the Karnaphuli Paper Mills at Chandraghona, East Pakistan are described. Combustion Engineering was the prime contractor and the Kuljian Corp. served as consulting engineers. The unit has a capacity of 65 tons of soda/day and produces 30,000 pounds of steam/hour at 425 p.s.i. and 775°F. In addition, the unit is provided with six oil burners. 1 flowsheet, 1 illustration, and 1 table listing the suppliers of the equipment. E.S.

ALUMINUM

PSATY, L. A. Converters have a shiny future with aluminum foil. Paper, Film and Foil Converter 28, no. 4: 28-32, 34, 36 (April, 1954).

Since it was first produced commercially in the United States just prior to World War I, aluminum foil has become the most available, economical, and commonly used metal foil. The numerous converting processes—under the general headings of lacquering and coating, laminating, embossing, and printing—as well as chemical and physical properties, various thicknesses available and costs, uses, and a prediction of future products are discussed. 5 tables and 8 figures. R.A.S.

ASSOCIATIONS

JONES, DOUGLAS. Technical section review—1953. Can. Pulp Paper Ind. 7, no. 4: 64, 66, 68 (April, 1954); *cf.* B.I.P.C. 23: 538.

The Executive Secretary of the Technical Section of the Canadian Pulp and Paper Association presents the annual review of activities of 1953. The projects of each of the 16 special committees are discussed, as well as activities of the 10 branches of the section, the summer meeting, awards, membership, staff changes, and elections. R.A.S.

BAMBOO

SINEATH, H. H., DAUGHERTY, P. M., HUTTON, R. N., and WASTLER, T. A. Industrial raw materials of plant origin. V. A survey of the bamboos. Georgia Inst. Technol. State Eng. Expt. Sta. Bull. 15, no. 18: 230 p. (December, 1953); *cf.* B.I.P.C. 24: 603.

In a survey and bibliography of bamboo, sections of interest to the pulp and paper industry are included on: the cellulosic and noncellulosic constituents, p. 13-17; species of bamboo being used for paper pulp, p. 24-30; suitable species according to various countries, p. 30-3 (U. S., p. 33); sizes of fibers obtained from various species, p. 33-40; various pulping processes (mechanical, soda, sulfate, "Gruco," sulfite, etc.), p. 40-7; suitable pulping procedures (comminution, bleaching, and digestion), p. 47-51; dissolving pulp, p. 51-3; conclusions on the manufacture of pulp from bamboo, p. 53-4; and economic potential, p. 77-9. Numerous tables and references. R.A.S.

BARKERS AND BARKING

BRECHT, WALTER, BOTT, RUDOLF, and WENZ, MARTIN. Investi-

gation of a Karlström wood barker. Das Papier 8, no. 7/8: 120-8 (April, 1954). [In German; English and French summaries]

The Papierfabrik Baienfurt installed a Karlström barker, the first of its kind in Germany, in its mill; the results of experiments with this barker are reported. The principle of the Karlström method consists in subjecting the round wood of optional length in steaming chambers to the reaction of saturated steam at atmospheric pressure for a number of hours, whereby the temperature rises to about 95°C. The hot wood, while still in the chambers, is immediately quenched by spraying with cold water, discharged, and barked with hydraulic jets. The sudden chilling is claimed to be essential for easy bark removal, since otherwise the bark will again firmly adhere to the wood. The systematic experiments with the new plant (which was not quite completed and in partial operation only) showed a very low loss in fiber substance (0.1% of the wood weight) with high freedom from adhering bark and bast, particularly with wood which had not been stored for more than one year. When the wood was stored for longer periods, the cambium layer frequently adhered quite firmly to the wood, although the bark was removed. Thermal requirements of the plant are rather high; power consumption is about equal to that of friction barkers. To obtain the required results, the steaming treatment must last for at least 10 hours. This causes a certain browning of the wood surface through which the brightness of groundwood pulp is reduced about 4-7%, and that of unbleached sulfite about 3-5%. The extent of this loss depends upon the diameter of the log and the length of the storage period. For certain quality products this loss in brightness may be higher than the mills can afford. The moisture content of the steamed wood increases about 5-10%, so that the resulting groundwood pulp becomes freer with somewhat longer fibers and increased strength properties. Power consumption of the chipper increases almost 20%; about 3% more chips cut from the steamed wood can be charged to the digester than when knife-barked dry wood is used. The resinous content of the pulps is reduced by half through this treatment. The easy removal of the bark through chilling could not be confirmed; as a matter of fact, immediate rinsing with hot water produced better results. In both cases it was imperative to avoid the redrying of the steamed wood. 10 figures and 9 footnotes. E.S.

BARKERS AND BARKING—CHEMICAL

COOK, DAVID B., and HAMILTON, LAWRENCE S. Chemi-peeling pulpwood in New York. J. Forestry 51, no. 8: 566-9 (August, 1953).

The advantages and disadvantages of chemical debarking of pulpwood are discussed, and results obtained in New York State with conifers and hardwoods are outlined. The exact pattern of response to the chemical treatment varies with the species; white ash was the only species investigated on which the bark seems to stick tighter after the application of the chemicals. Preliminary cost data are included. 2 figures and 8 references. E.S.

BEATING

CASKEY, FRANK E. Strength development through stock refining as influenced by certain variables. Tappi 37, no. 4: 156-62 (April, 1954).

Based on a method (*cf.* B.I.P.C. 18: 300) which uses the laboratory 1.5-lb. beater as a reference standard, the author shows the results obtained from a study of some of the variables of stock refining in both experimental and commercial equipment. The variables considered are stock consistency, con-

tact pressure, bar widths, and species of pulpwood. The optimum bedplate loading on the laboratory 1.5-lb. beater for developing burst, tensile, and tearing resistance of all pulps tested was obtained by using a 2.5-kg. weight on the lever arm during the entire beating cycle. Further evidence was obtained showing that for the development of high burst and tensile it was necessary to use refiners equipped with tackle of approximately 1/4 inch, and to operate the refiner at a relatively low power setting. Moreover, in any refiner or beater the equipment must be in the best mechanical condition to obtain good strength development. High stretch was obtained by operating the mill beater at the highest consistency possible. 3 tables, 11 figures, and 7 references.
E.S.

BIRCH

KHUTORSHCHIKOV, I. S. Kraft cooking of birch. Bumazh. Prom. 28, no. 12: 22-5 (December, 1953). [In Russian]

For abstract *cf.* C.A. 48, no. 7: 4216-17 (April 10, 1954). 7 tables. E.S.

BOARD

MARRA, GEORGE G. Manufacture of hardboard in the United States. Paper Trade J. 138, no. 14: 26, 28, 30-2, 34, 37-8 (April 2, 1954).

The status of the hardboard industry in the United States is reviewed, reasons are cited for the rapid development, and indications of future trends are given, particularly the great amount of expansion possible since large amounts of residue material are available. Total production capacity by the end of 1954 is expected to exceed 1,763,160,000 sq. ft./year. The essential differences in processes of manufacture, waste materials utilized, and products are emphasized. Brief descriptions of manufacturers and their production capacities are presented in a classification according to processes: wet fiber processes—Forest Fiber Products Co., Masonite Corp., U. S. Gypsum Co., Oregon Fiber Products, Inc., Oregon Lumber Co., Chapman Manufacturing Co., and Superior Wood Products Co.; dry fiber processes—Anacortes Veneer Co., Coos Bay Lumber Co., Willamette Fibre Board, Inc., Weyerhaeuser Timber Co., Montana Hardboard Co., and Washington Hardboard Co.; dry granular processes—Cascades Plywood Corp., Rock Island Millwork, Inc., Chipcraft Co., and Dean Co.; and flake and shred processes—United States Plywood Corp., Long-Bell Lumber Co., and Pack River Lumber Co. 1 table and 13 references. R.A.S.

YALE, ROLLIN H. Wood versus substitutes in the furniture and cabinet industry. J. Forest Products Research Soc. 4, no. 2: 24-6A; discussion: 26-7A (April, 1954).

The advantages in the use of wood waste in the furniture industry, both in the boards (Chipcore and hardboards) produced and in the aim toward the conservation of forest resources, are discussed. R.A.S.

BOARD—DEFECTS

SCHWINKLER, JOSEPH J. Dimensional instability: constant variable in boxboard manufacturing. Tappi 37, no. 4: 168-70A; discussion: 170A (April, 1954).

Dimensional stability is rarely considered in the manufacture of paperboard and folding cartons, because the usually minute variation in the dimensions of the boxboard gives no cause for concern. Dimensional instability may

create occasional problems in packaging, such as improperly fitting lids, loosening of can bands, etc.; however, in relation to the tonnage of board produced, the consideration is a minor one. Curling problems, on the other hand, constitute one of the daily difficulties in board manufacture; the effects of curly and warped boards are felt throughout the carton plant and often in the packaging plant as well. The excellent control of board curl on the paper machine again keeps this difficulty to a minimum. 2 tables. E.S.

BOARD—FINISH

BACHMANN, A. E. Effect of materials on finish and printing smoothness. Tappi 37, no. 4: 197-9A; discussion: 199-211A (April, 1954).

The author discusses the influence of material characteristics as such (divorced as far as possible from effects of stock preparation and machinery variables) on finish and printing smoothness (I). (I) is defined as the necessary degree of levelness which, in combination with the proper bulk and degree of compressibility under printing pressure, will result in a satisfactory appearance of the print. The relative bulk of a specific material is one of the most important properties from the standpoint of (I), because it largely determines the compressibility of the sheet. The degree of levelness required for satisfactory printing will reach a maximum requirement in the case of letterpress printing on lightweight incompressible boards of high density and will be at a minimum on high-bulk boards which will permit adequate compression and become level under printing pressure. The preservation of bulk leads to a consideration of formation which involves the relative length of fibers and the jordaning properties (II) of the material. (II) are much more a factor in handling pulps than waste paper; their measurement is a problem which has not yet been entirely solved. E.S.

BROWN, DUNCAN S. The effect of the vat section on finish. Tappi 37, no. 4: 195-6A (April, 1954).

The author discusses the way in which the design and operation of the cylinders and vats will affect the finish of paperboard, with particular reference to printability. E.S.

CHAMBERLAIN, L. B. The design and operation of a press section for good finish. Tappi 37, no. 4: 191-5A (April, 1954).

The author describes seven different board-machine constructions to illustrate that it is possible to make high-quality boxboard with a good finish with several different press designs. Felt marks, felt whippers, nip pressures, roll size, Plastometer specifications for rubber-covered rolls, roll overhang, finishing presses, cylinder and extractor wire marks, incompressibility, felt pick, checking, crushing, and cockling in the press section and their effects on board finish are discussed. The fundamentals for obtaining satisfactory results are the avoidance of excessive nip pressures, the use of low moisture contents on entering the section, and proper design of drives and bearings so that a fine felt can be used without incurring excessive felt costs or loss in production. Preventive maintenance of the press section is imperative to maintain a uniform finish in day-to-day operation. 7 diagrams. E.S.

MANOGUE, E. F. Some effects of stock preparation on smoothness. Tappi 37, no. 4: 196-7A (April, 1954).

The effects of the following factors in stock-preparation on the smoothness of the resulting board are reviewed: cleanliness, slime control, pitch dis-

persal, trash removal, white water and fines, stock consistency and freeness, high temperatures and high alum percentages in sizing, and supply water. The machine operator should be provided with a clean stock of suitable freeness and proper stability in so far as chemical additives are concerned. E.S.

MARTIN, DARRELL M. Functional qualities of boxboard as related to smoothness and methods of testing. Tappi 37, no. 4: 183-5A (April, 1954).

The author first discusses the following visible defects in paperboard: felt and wire marks, checks, crush, cockle, mechanical damage, and foreign matter. These can be sufficiently severe to be objectionable for unprinted items; they are definitely objectionable in printed board, regardless of their severity. Semivisible defects, such as incompressibility, surface voids, interfiber voids, lumpy formation, and fuzziness are not critical in end-use requirements for unprinted board, but are of vital importance when first-class printing is essential. Presently used testing methods for smoothness are reviewed; not one of them will give an accurate and rapid determination of printing smoothness which can be related to board performance. E.S.

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. *Papermaking (Cylinder) Committee.* Smoothness of paperboard symposium. Tappi 37, no. 4: 181-211A (April, 1954).

In the introduction to the symposium, the chairman outlined the general program in which "smoothness of paperboard (all types being made on a cylinder machine) including both visual and printing smoothness" was adopted as the topic. The various undesirable qualities affecting the smoothness of a sheet are considered, including lumpy formation, felt marks, wire marks, foreign matter (shives, slime spots, etc.), fuzziness, interfiber voids, incompressibility, surface voids, checking, crushing, cockles, and mechanical damage (including scabs, press cuts, and calender cuts). The individual articles dealing with the above factors as related to smoothness in end-use requirements, testing, finishing, drying, wet-end operations, stock preparation, and raw materials are abstracted under the name of each contributor to this symposium. E.S.

WINRICH, K. M. Smoothness of paperboard as related to finishing. Tappi 37, no. 4: 185-6A (April, 1954).

The author describes the effects of the calendering operation and the possibilities open to the boardmaker to improve improper preceding operations; however, the calender can also cause or accentuate certain factors and harm smoothness. Successful calendering begins in the beater room and demands the proper co-operation from all preceding phases. Errors or faults coming from these operations can be helped only if they are not too severe. Mention is also made of the accidental inclusion of shavings and scraps of paper or board from the cutters and slitters. Although the sheet smoothness as such is not involved, these inclusions may play havoc with the printing plates and spoil the efforts made to produce a smooth sheet. E.S.

WINRICH, K. M. Smoothness of paperboard as related to the drier section. Tappi 37, no. 4: 186-7A; discussion: 187-90A (April, 1954).

The driers have little, if any, influence on improving any area of smoothness, whereas they can seriously impair them. The surface smoothness of the driers, gradual heating, proper tension, uniform drying, driers of sufficient diameter, and properly screened air supplied to the section to exclude bugs

and dirt are some of the factors which will influence the final result.
E.S.

BOARD, BOX

ANZENHOFER, RUDOLF. Up-to-date manufacture of machine-made leatherboard and its conversion. Allgem. Papier-Rundschau no. 6: 241-3 (March 20, 1954). [In German]

The continuous manufacture of leatherboards from steamed spruce groundwood on machines with either Fourdrinier wire, vats, or a combination of both is described. The boards may be lined with paper on one or both sides and the laminating machine may be combined with the board machine, followed by the slitters and cross cutters, which cut the boards to the required size and deliver the sheets automatically in piles. The further conversion to boxes of all kinds is carried out on high-speed machines, which combine the cutting, scoring, creasing, folding, and printing operations in one unit. 3 illustrations. E.S.

BOARD, FIREPROOF

ELMENDORF, ARMIN. Fire-resistant boards made of wood strands and inorganic binders. J. Forest Products Research Soc. 4, no. 2: 87-9 (April, 1954).

Two types of fire-resistant boards can be made which are commercially sound, using specially cut wood strands obtained from cord wood, defective logs, and cores remaining from the cutting of veneer. A board made with portland cement as the binder can be felted in a continuous operation but requires over-night pressing. This board has excellent sound-absorbing value and is comparable in this respect with conventional acoustical tile. Its manufacturing cost is far below that of acoustical tile. The second board referred to as a porous embedded fiberboard is made of the same strands bonded with gypsum. It is faced on both sides with gypsum applied by machinery in the factory. The total materials cost for this board in the 0.5-inch thickness is only 1.5 cents/sq. ft. It is more fire-resistant than paper-faced gypsum boards and stronger and stiffer. It is also very much stronger and stiffer than insulation board and much stiffer than ⅜-inch plywood across the grain of the faces. It has a large potential market for dry-wall construction to replace lath and plaster and as bevel-edged planking with concealed nailing. 2 figures. E.S.

BOARD MILLS

ANON. New semi-chemical .009 operations at Filer City. Fibre Containers 39, no. 3: 36, 38, 40, 43-4, 46, 50, 52, 54 (March, 1954); *cf.* B.I.P.C. 24: 607.

The description of the Filer City, Mich. mill of American Box Board Co., which produces nine-point corrugating medium from aspen wood, is similar to that in the previous reference. 2 flowsheets and 26 illustrations.
R.A.S.

ANON. Valdosta is mechanized and interlocked. Pulp & Paper 28, no. 4: 62-6, 68, 70, 72, 74-5 (April, 1954); Paper Trade J. 138, no. 16: 38-45 (April 16, 1954).

A detailed illustrated description of the new kraft pulp and board mill of National Container Corp. at Valdosta, Ga., designed for a minimum output of 500 tons of containerboard/day, is given. The construction is suitable to the

climate without excessive heaviness; Johns-Manville corrugated Transite was used for the exterior. Southern pine logs arrive at the mill by truck or rail cars from company-owned land or local woodlot owners within a 70-mile radius. The mill comprises an open-air wood mill, a causticizing plant, a five-digester pulp mill, a two-boiler liquor recovery plant, and a 240-inch Bagley & Sewall Fourdrinier machine with the necessary auxiliary equipment, as well as power-plant and water-treatment facilities and a large ponding area. The flowchart of the mill shows a U-shaped processing line with wood entering and finished rolls leaving at the same end. Although the two articles describe essentially the same installations, they are not identical in text. 1 flowsheet and 15 illustrations in the first reference and 19 illustrations in the second. E.S.

OTIS, D. BRUCE. Manchester builds nation's newest . . . cylinder mill. Paper Trade J. 138, no. 17: 16-19, 21 (April 23, 1954).

A description is given of the recently completed board mill of Manchester Board & Paper Co. at Richmond, Va., which is capable of producing up to 100 tons of board/day (including folding and chip grades) from waste paper and virgin pulp. Three Shartle Bros. Hydrapulpers, a Shartle Hydrafuge and Classifiner, five Miami jordans, a Hydrafiner with Duotrol drive, two Whitlock heater-Midwest Fulton condensate handling units, an eight-cylinder Black-Clawson machine, and two seven-roll calender stacks are some of the major equipment installed. 10 illustrations. R.A.S.

BOARD MILLS—WASTE LIQUOR

SCHOLZ, WERNER. Operating results from a waste-water purification plant in a board mill employing humic acid. Wochbl. Papierfabrik. 82, no. 1: 9-10 (Jan. 15, 1954). [In German] *cf.* B.I.P.C. 24: 59.

The successful results with Daqua (a humic acid preparation manufactured by Zschimmer & Schwarz, Brilon, Westphalia, Germany) in the treatment of the effluent of a board mill with closed white-water circulation using about 30% of straw (cooked with lime) and 70% of waste paper as a raw material are described. The mill effluent was originally discharged into a lagoon below the mill and contained a large amount of fiber debris and mucilage which the old clarification system was not able to retain. Although two additional settling basins were constructed following the lagoon, the desired clarification did not result, and the contents of the basins caused obnoxious odors for the neighborhood. When about 4 kg. of Daqua/hour was added to the recirculating white water, the troublesome fiber debris and mucilage, as well as the Daqua chemicals, were deposited in the form of flocs on the machine wire and retained by the board with an increase of about 4% in yield. The quality of the board is not lowered; drainage on the machine is actually improved so that machine speed can be increased. With the essential addition of 0.6-0.8 kg. of chemicals/100 kg. of board, the color of the product is not affected; with a three- or fourfold amount, a slightly brown coloration becomes noticeable. The mill effluent is now practically fiber-free, and the two settling basins are no longer needed. Additional advantages in mill operation and the economics of the process are discussed briefly. E.S.

BOARD SPECIALTIES

HEBB, E. A. Preservative treatment for paperboard seed traps. J. Forestry 52, no. 4: 249 (April, 1954); *cf.* B.I.P.C. 22: 730-1.

Brush treatments of the kraft paperboard seed traps described in the

previous reference with either 5% pentachlorophenol in linseed oil, a saturated solution of paraffin in naphtha, or clear shellac were found to extend their durability at least through a second season. The first of the three treatments seemed preferable, because it prevented the formation of mold on the paperboard. E.S.

BOARD TESTING—PHYSICAL

ELY, HAROLD M. Experiments on an accelerated method for determining water absorption of hardboard. J. Forest Products Research Soc. 4, no. 2: 85-7 (April, 1954).

Pressure-absorption test specimens grouped according to specific gravity were used to plot a correlation curve in tests conducted to develop an accelerated method for determining the water absorption of hardboard. 2 tables and 5 figures. R.A.S.

SYME, JOHN H. Sealers for finish coats on hardboard. J. Forest Products Research Soc. 4, no. 2: 84-5 (April, 1954).

The results of hardboard painting tests conducted by the Oregon Lumber Co. to determine the effectiveness of various sealers are presented. The only acceptable results were obtained with pigmented polyvinyl acetate and latex copolymer. R.A.S.

CELLOPHANE

ANON. Saran-coated cellophane. Modern Packaging 27, no. 8: 80-3, 176 (April, 1954); *cf.* B.I.P.C. 24: 608-9.

Saran resin applied as a coating on cellophane (named K-202 by its original producer) shows promise of widening the packaging field for this transparent film by combining the best properties of the two films. The saran-coated film offers an extra margin of protection for products that require additional strength in the package; resistance to water vapor, gases, grease, and abrasion; and dimensional stability. 3 tables and 6 figures. R.A.S.

CELLULOSE

BARTUNEK, RICHARD. Problems and trends of present cellulose research. Das Papier 8, no. 5/6: 78-83 (March, 1954). [In German; English and French summaries]

The principal problems concerning the different structural elements of the native cellulose fiber (macromolecules, crystallite strings, fibrils, lamellas, outer skin substance, etc.) are reviewed. The relationship between fiber structure, size and structure of the reacting particles, and the state of order in solutions of electrolytes and the mode of reaction of cellulose is discussed. A summary of important problems still awaiting solution and of recent developments in methods for solving them is appended. 5 figures and 57 references. E.S.

CELLULOSE—CRYSTALLINITY

MANN, J., and MARRINAN, H. J. Conversion of cellulose I to cellulose III by ethylamine. Chemistry & Industry no. 41: 1092-3 (Oct. 10, 1953); *cf.* B.I.P.C. 21: 538-9.

The treatment of bacterial cellulose with ethylamine produces a significant reduction in crystallinity. If the amine is removed by evaporation, there is

no change in the type of crystal lattice. If it is removed by transfer to chloroform without appreciable evaporation, cellulose III is produced. 3 references.
K.W.,Jr.

CELLULOSE—DEGRADATION

KLEINERT, THEODOR N., and WINCOR, W. Carboxyl content and thermal degradation of cellulose. Textil-Rundschau 9, no. 4: 201-5 (April, 1954). [In German]

Free carboxyl groups in cellulose either naturally present or introduced during processing contribute to thermal instability, whether measured by reduction of D.P. or by increase in color. In either case the thermal stability of the material can be improved by neutralization of the carboxyls with calcium salts. 3 tables, 3 figures, and 16 footnotes. K.W.,Jr.

SHARPLES, A. The hydrolysis of cellulose. Part I. The fine structure of Egyptian cotton. J. Polymer Sci. 13, no. 70: 393-401 (April, 1954). [French and German summaries] *cf.* B.I.P.C. 24: 93.

The kinetics of chain degradation have been studied for the heterogeneous hydrolysis of Egyptian cotton under mild acid conditions. The results have been interpreted to give estimates of accessibilities free from the defects associated with former measurements. The amount of accessible material in the undegraded cotton was found to be 10.8%, but during hydrolysis this is reduced to less than 5%. The recrystallization takes place at an early stage in the degradation, starting at a point when approximately one eighth of the intercrystalline chain segments have been broken. 1 table, 4 diagrams, and 15 references. E.S.

CELLULOSE—HEMICELLULOSE

ROUDIER, A. Fundamental studies on the hemicelluloses; their importance in the utilization of cellulosic pulps. Assoc. tech. ind. papetière, Bull. no. 2: 53-62 (1954). [In French]

Relying largely on paper chromatographic separations of hydrolyzed hemicelluloses (I) from wheat straw, the author has in the main confirmed the findings of Adams (*cf.* B.I.P.C. 23: 89-90). (I) in 15% yield were isolated from the pulp by 12% sodium hydroxide, and contained 98.5% pentosans (calculated as xylan), 4.01% uronic anhydride, and 1.14% ash. After hydrolysis with 0.5 *N* sulfuric acid, the sugars found were 83.9% xylose and 3.2% arabinose, and traces of glucose and galactose. Details are given for the methylation and hydrolysis of (I), and the author concludes that since no monomethyl derivative of arabinose was formed and only the trimethyl derivative, the original (I) does not represent a mixture of xylan and a branched araban. The aldobiouronic acids formed are presumably 3-α-D-glucuronosyl-D-xylose, its monomethoxyl derivative (position of the methoxyl group indeterminate), and 6-β-D-glucuronosyl-D-galactose; galacturonic and glucuronic acids are also present. Approximately 41 xylose units are linked through positions 1 and 4, β-glycosidically. Branching from this chain and linked in either case to carbon 3 (in a xylose unit) are (*a*) an arabofuranose unit, and (*b*) a glucuronic acid or methoxyglucuronic acid unit. By hydrolyzing (I) cautiously with oxalic acid, arabinose was removed completely and only very small amounts of uronic acid residues remained. The xylan chain then contained 31-32 units. Difficulties in complete interpretation of the data are discussed. Brief allusion is made to the possible ion-exchange properties of the uronic acid groups in (I) and to their effects (and those of arabinose

units) on pulp swelling and properties. 3 tables, 3 figures, and 26 references. L.E.W.

WALDMANN, E., PREY, V., and KRZANDALSKY, W. Problems in hemicellulose research. Das Papier 8, no. 5/6: 84-9 (March, 1954). [In German; English and French summaries] *cf.* B.I.P.C. 24: 267-8.

Following a review of previous work on methods of recovery, chemical constitution, structure, and D.P. of hemicelluloses, the authors discuss the results of their own experiments. Beechwood shavings were extracted successively with 4% and 24% sodium hydroxide at room temperature in the absence of air. In either case, the extract was filtered, concentrated *in vacuo* to a sirup, and precipitated with ethanol and acetic acid giving, respectively, hemicelluloses A and B. The fibrous residue left after removal of B was extracted two hours at 100°C. under nitrogen with 4% sodium hydroxide, yielding hemicellulose C after treatment similar to those listed. A, B, and C were purified by resolution in alkali and reprecipitation, and analyzed for lignin, uronic anhydride, ash, and methoxyl. The average (number) D.P. and $[\alpha]_D$ for purified A, B, and C were, respectively, 153, 155, and 144, and −85.2°, −84.2°, and −. A was fractionated by precipitation, and these fractions showed markedly different D.P.'s and $[\alpha]_D$, which is in harmony with the findings of Wethern (*cf.* B.I.P.C. 22: 816), who showed that hemicellulose fractions of spruce were nonhomogeneous. Even long standing at room temperature with aqueous sodium hydroxide had little effect on hemicellulose A. After heating with alkali, about 80% of the hemicellulose (somewhat modified) could be recovered. Hot alkaline treatment caused the fission of significant amounts of (unidentified) acid. Hydrolysis of A and B gave only xylose and uronic acid. Hemicellulose C gave these same products together with very small amounts of glucose (probably less than 2%). 6 tables and 41 references. L.E.W.

CELLULOSE—OXYCELLULOSE

HOLDEN, R. Detection of free hydroxyl radicals during the oxidation of cellulose in air. Nature 173, no. 4403: 539 (March 20, 1954).

Dyed cellulose fabrics are printed with pastes containing sodium sulfoxylate formaldehyde and steamed to discharge the color to produce white designs on colored grounds. If the fabric remains moist for some hours before the residual paste is removed, the unused reducing agent and the cellulose are simultaneously oxidized by the air. The author impregnated cellulosic fabric with a neutral solution of sodium sulfoxylate formaldehyde and naphthalene-1-sodium sulfonate. After several hours in a moist atmosphere, the fabric was made alkaline and treated with an excess of diazotized sulfanilic acid. The author interprets the resulting pink color as due to coupling of the diazonium compound with a naphthol derived from the naphthalene sulfonate by means of free hydroxyl radicals and concludes "that free radicals are involved in the oxidation of cellulose under the conditions used in these experiments." 4 references. K.W., Jr.

CELLULOSE—SORPTION

MANN, H. B., and MORTON, T. H. The kinetics of absorption of water and aqueous solutes by dry viscose cellulose. Discussions Faraday Soc. no. 16: 75-84 (1954).

The kinetics of absorption by single viscose filaments have been studied in

three aspects: kinetics of wetting, kinetics of the absorption of simple solutes such as inorganic salts and urea on wetting the fiber in aqueous solutions, and the kinetics of dye absorption on wetting the fiber in a solution containing dye. The wetting of the fiber is a comparatively rapid process taking about 10 seconds for completion at 20°C. The rate of wetting is dependent both on fiber dimensions and temperature; it is approximately proportional to surface area, and the rate of increase with temperature corresponds to an activation energy of about 7 kg.-cal./mole. Simple inorganic salts, urea, glycerol, and sucrose are taken up by the fiber proportionately rather slower than water on immersion of the fiber in the corresponding aqueous solution. The absorption of a direct cotton dye on wetting the fiber in aqueous solution follows a different course. Very little dye is absorbed during the period of wetting, the dye being presumably concentrated in solution at the interface of the swelling fiber; thereafter redistribution of the dyestuff occurs by well-understood diffusion mechanisms. 3 tables, 7 figures, and 7 references. E.S.

CHEMICAL TESTING—GASES

KÖNEN, HERMANN. The determination of sulfur dioxide and sulfur trioxide in burner gases by means of iodine solution. Das Papier 8, no. 5/6: 90-1 (March, 1954). [In German; English and French summaries]

An improvement in the sulfur dioxide and sulfur trioxide values of the Frank-Schmidt method of analysis for sulfur gases (*cf.* Papier-Fabr. 23: 229-32 [1925]) is obtained when a 0.1 *N* solution of iodine containing 125 grams instead of 25 grams/liter of potassium iodide is employed for the titration in a wide-mouthed Erlenmeyer flask. Vessels offering a flat open surface should be avoided. Methyl red is recommended as a suitable indicator, whereas methyl orange, Congo red, and phenolphthalein in particular should not be used. 2 tables. E.S.

CHEMICAL TESTING—PAPER—ASH

NAVARRO, J. Analysis of paper fillers. Afinidad 30, no. 123/124: 52-5 (March-April, 1953); Papeterie 75, no. 8: 543-5 (August, 1953); Tech. Bull. Tech. Sect., Brit. Paper and Board Makers' Assoc. 30, no. 6: 178-82 (December, 1953). [Original in Spanish; translations in French and English. Translations only available]

Mineral loadings or fillers are generally identified by analysis of the paper ash. Up to 3% of ash may arise from alum and from the cellulose fibers. Values are given for the loss in weight of the fillers themselves during incineration. Two tables give in outline form the systematic schemes of analysis tested and proved by the author. One describes tests on water and acid extracts of the paper, the second deals with methods applied to the ash obtained upon incineration of the paper. Separate tests are given for the mineral pigments ochre, lead chromate, and ultramarine. Lampblack is recognized by disintegrating the paper in methyl salicylate and examinating microscopically. 3 tables. B.L.B.

CHEMICAL TESTING—PULP—ALPHA CELLULOSE

CHARLES, FRANK R. A cellulose yield test overcoming the inadequacies of the alpha test. Tappi 37, no. 4: 148-56 (April, 1954).

The α-cellulose test has several disadvantages for measuring the viscose rayon yield from a given pulp. It is too subject to experimental error and is

more affected by lowered viscosity than is the rayon yield. It measures solubility in caustic soda under conditions quite different from those of the viscose manufacturer. The "rayon cellulose test" described by the author consists briefly of treatment with 21.5% sodium hydroxide. After filtation both fractions are determined by dichromate oxidation. The ratio of the dichromate used by the resistant cellulose to the sum of that used by both fractions is called rayon cellulose. Results are given comparing the two methods with the actual yield of viscose for 66 commercial and 50 experimental pulps. The rayon cellulose test is simple, precise, and agrees very closely with the actual yield. 8 tables, 5 diagrams, and 9 references. K.W.,Jr.

CHEMICAL TESTING—PULP—RESIN

JULLANDER, INGVAR, and OLSSON, BERTIL. Rapid determination of resin in dissolving pulp. Svensk Papperstidn. 57, no. 5: 151-8 (March 15, 1954). [In English; German and Swedish summaries]

The Swedish standard method CCA 2 (*cf.* B.I.P.C. 14: 238) prescribes an extraction time of six hours for each solvent used. Even if the extraction is made with one solvent only, the total time for an analysis amounts to at least 10-12 hours in practice. The Soxhlet extraction with ethanol can be substituted by shaking with warm ethanol for five minutes. Wet pulp from the mill can be extracted directly without previous drying. The bottleneck of this analysis (as far as time is concerned) involves the evaporation of the solvent and drying of the residue. Ultraviolet spectroscopy would save much time but cannot be recommended without further studies. A colorimetric method for determining the resin content was therefore developed, based on the observation that the dyestuff Rhodamine B in aqueous solution is absorbed by pulp in an amount which is almost proportional to the amount of the resin extract. Five grams of airdry pulp torn into small pieces is placed in a 400-ml. beaker with 185 ml. buffer solution prepared from potassium biphthalate, sodium hydroxide, and water to maintain a pH of 4.1. After stirring the suspension mechanically for 10 minutes, 10 ml. of the Rhodamine solution is added and the stirring continued for another 10 minutes. The suspension is then centrifuged (or filtered) for 15 minutes, and the light absorption of the supernatant clear liquid is measured in a colorimeter against distilled water. The total time required for an analysis amounts to 30 (when filtering is used) to 45 (with centrifuging) minutes. The present investigation was limited to experiments with dissolving pulps. 9 tables, 8 figures, and 30 references. E.S.

CHEMICAL TESTING—ROSIN

JALAVA, P. O. Investigation of rosin acids. I. Titrimetric determination of rosin acids with two double bonds in pure rosin acid mixtures with bromine in methanol. Paper and Timber (Finland) 36, no. 3: 69-70 (March, 1954). [In Finnish; English summary]

The percentage of rosin acids with two double bonds in mixtures of rosin acids (1 gram) can be determined by titration with 0.2 *N* bromine in methanol. The end point of the titration is indicated by the development of a yellow color caused by unreacted bromine. By this method it is possible to obtain the sum of levopimaric, abietic, neoabietic, dextropimaric, and isodextropimaric acids, and pyroabietic acid (dehydroabietic, dihydroabietic, and tetrahydroabietic acids) indirectly by difference. The rosin acids with two double bonds react with bromine instantaneously. Dehydroabietic and tetrahydroabietic acids do not react at all, and dihydroabietic acid only very slowly. Methanol was found to be the best solvent for bromine. The normality of the bromine

solution must be checked each time before the titration is performed. Bromine does not dissolve sufficiently in the usually employed carbon tetrachloride, and the resulting solution is not uniform in concentration. In addition, the bromine compounds of the rosin acids give a yellow color in carbon tetrachloride which renders the detection of the end point very difficult. Satisfactory results were not obtained with iodine monochloride. The error of the titration analysis described has been found to be ±1%. 1 table, 1 figure, and 4 references.

E.S.

CHEMICAL TESTING—WHITE LIQUOR

VENEMARK, EMIL. Analysis of white liquor, a useful control method; the influence of sulfite during acidimetric titration. Svensk Papperstidn. 57, no. 6: 194-203 (March 31, 1954). [In Swedish; English and German summaries]

The use for a rapid, easily reproducible, and accurate routine method for the analysis of white and green liquors in sulfate mills is stressed. A comparison of the titration methods used at the Husum sulfate mill since 1947 (H) with three other methods [(I) similar to Swedish standard CCA 18, *cf.* B.I.P.C. 19: 695; (II) similar to TAPPI Standard T 624 m-44; and (L) Lunge and Lohöfer, involving double titrations with phenolphthalein and bromophenol blue combined with an iodine titration] is made. (H) involves the following: (*a*) 5 ml. of the liquor is titrated with 1 *N* hydrochloric acid and bromophenol blue or methyl orange as indicator for total alkali, i.e., sodium hydroxide, sodium sulfide, and sodium carbonate; and (*b*) 5 ml. of white liquor is mixed with 20 ml. of barium chloride (200 g./l.), diluted with water to 100 ml., and titrated with 1 *N* hydrochloric acid, with thymolphthalein as indicator, giving sodium hydroxide and half of the sodium sulfide; then 5 ml. formalin (40%, neutralized) and phenolphthalein are added, and the titration is continued after 30 seconds (other half of the sodium sulfide). For the determination of the active alkali only, the liquor is mixed with barium chloride, water, formalin, and phenolphthalein and titrated. In solutions of sodium hydroxide and sodium carbonate, (II) even with phenolphthalein gives too low values for the former and too high values for the latter. Thymolphthalein gives very good values for the first half of sodium sulfide; however, when sodium carbonate is also present, phenolphthalein must be used, which decreases the accuracy of the titration. Methods (H) and (I) give identical correct results for sodium hydroxide, sodium sulfide, and sodium carbonate, but (H) is much less complicated and more rapid than (I). (II) gives low results for active alkali and causticity; it is more complicated but of technical value equal to (H) and (I). (L) gives somewhat irregular results, although they are similar to (II) when the carbonate content is low. Thiosulfate does not influence the above titrations. On the other hand, in solutions containing considerable quantities of sulfite and sulfide, side reactions will start as soon as the acid is added. In acid solutions, the bisulfite ion is reduced by hydrogen sulfide with formation of sulfur, and high values for total titratable alkali are obtained. Even in alkaline solution, a local excess of acid will liberate sulfur, which will be dissolved by the alkali present and give polysulfide and thiosulfate. Since these side reactions are rather slow, the usual rapid bromophenol blue titration to a pH value of 3.5-4 gives a reasonably accurate value for total titratable alkali. An addition of furfural is not necessary, but may be of value as a reference method. With slow working and inefficient stirring (for instance in potentiometric titrations) appreciable errors, particularly at pH 8-9, may occur. Since the side reactions are irreversible, sulfite even in the form of precipitated barium sulfite will cause errors. Formaldehyde reacts with sulfites, forming a strong monobasic acid which prevents the use of the (H) titrations in the presence of appreciable

amounts of sodium sulfite. For technical sulfate liquor with less than 10 g./l. of sodium sulfite at the usual alkali concentration, (H) was found the best method, giving rapid, correct, and reproducible values. When the liquor contains more than 20 g./l. of sodium sulfite, only (H) or methods of a similar type can be recommended. 4 tables, 1 diagram, and 20 references. E.S.

CHEMICAL TESTING—WOOD—LIGNIN VALUE

KÜRSCHNER, K., and SCHWEIZPACHER, T. A new method for the quantitative determination of lignin. Faserforsch. u. Textiltech. 4, no. 7: 287-93 (July, 1953). [In German]

An indirect method for the determination of lignin by estimating the methoxyl content in lignified materials is described. The methoxyl groups are saponified by heating the sample with 82% sulfuric acid at 200°C.; the methanol is distilled off, the distillate is made alkaline with sodium hydroxide, and the methanol again distilled off. The methanol is oxidized with an excess of standard potassium permanganate, and the excess permanganate titrated with oxalic acid. By subtracting the amount of potassium permanganate consumed in a blank experiment from that used for the oxidation of the methanol and multiplying the amount consumed by the methanol with a factor (5.5 for coniferous, and 4.0 for deciduous woods), the lignin content of the wood is obtained. The method for the determination of the methoxyl content has been checked with vanillin, vanillic acid, and other known methoxyl-containing compounds with very good results. A methoxyl content of 5.72% has been found for spruce, and of 6.76% for beech. 6 tables, 3 figures, and 26 references. F.E.B.

KÜRSCHNER, KARL, and SCHWEIZPACHER, TRUDE. The lignin determination according to Kürschner-Schweizpacher. Faserforsch. u. Textiltech. 4, no. 12: 507-9 (December, 1953). [In German] *cf.* abstract above.

The methoxyl determination according to Kürschner-Schweizpacher fluctuates in the presence of large amounts of carbohydrates, which cause the formation of carbon oxide; the latter also consumes potassium permanganate. By the addition of 10 cc. of 0.5% silver nitrate solution to the boiling alkaline solution of methanol, the carbon oxide is oxidized without effect on the methanol, which is then titrated with potassium permanganate as described before. 5 tables and 3 references. F.E.B.

CHLORINE DIOXIDE

RAPSON, W. HOWARD. A comparison of processes for the generation of chlorine dioxide in pulp mills. Tappi 37, no. 4: 129-37 (April, 1954).

The author has studied the operation of 12 chlorine dioxide plants, including at least one of each of the six processes now being offered for generating chlorine dioxide in pulp mills. Three of these processes are in operation in Europe, known by the names of their inventors, Holst, Persson, and Kesting. The three originating on this continent, known by the companies developing them, are Canadian International Paper Co. (C.I.P.), Mathieson, and Solvay, in order of development. All six processes operate well and are producing chlorine dioxide of sufficient quantity and quality to satisfy the requirements of pulp bleach plants. Major differences among them are found in capital cost; raw material requirements; maintenance difficulties; ease of start-up, shutdown, and change of production rate; simplicity of control; and

explosion hazards. A comparison is made of chemical reactions, equipment requirements, materials of construction, operating problems, material balance, and relative cost of chlorine dioxide for the various processes. 3 tables, 6 diagrams, and 14 references. E.S.

COLOR

DÉRIBÉRÉ, MAURICE. Color, an industrial factor. Papeterie 76, no. 1: 11, 13, 15, 17, 19 (January, 1954). [In French]

The author stresses the importance of correct color selection and combinations and type of illumination, supplemented by numerous examples of the psychological effect of color on the worker. The recommendations of AFNOR (the French standardizing agency) for a color safety code are listed. 4 tables. E.S.

CONTRACT PACKAGING

ANON. What about contract packaging? Modern Packaging 27, no. 8: 71-7, 167-8 + 1 folded table (April, 1954).

The variety of services offered by contract packagers is discussed; these companies have facilities ranging from standard equipment to special processing machines, storage and packaging areas equipped for humidity and temperature control, and laboratories and departments for machinery or package development. These services are especially advantageous for market coverage of areas distant from manufacturing facilities, intermittent operations or fluctuating loads, pilot-line production for new products, and specialized packaging, particularly for sample-size packets. A list of companies with the products packaged, containers handled, and specializations is appended. 1 table and 12 illustrations. R.A.S.

COOKING PROCESS

JAYME, GEORG, and WÖRNER, GÜNTHER. The reducing alkaline pulping of plant materials. V. The use of rongalite. Das Papier 8, no. 7/8: 128-9 (April, 1954). [In German; English and French summaries] *cf.* B.I.P.C. 23: 93-4.

In a preliminary note, reference is made to previous laboratory cooking experiments with sodium hydrosulfite (sodium dithionite) (I) which gave a higher yield of polysaccharides, a decrease of the residual lignin in the pulp, a considerably lighter color of the pulp with better bleachability, a higher D.P., an increase in strength properties, and a decisive decrease or even complete elimination of odor troubles than a standard sulfate cook. Similar favorable results were obtained when sodium formaldehydesulfoxylate (rongalite) was substituted for (I) in experimental sprucewood cooks (liquor composition, 3.48% sodium hydroxide and 4.23% rongalite; liquor ratio, 1:7.5; maximum cooking temperature, 180°C.; and cooking period at maximum temperature, eight hours). The residual lignin in the resulting pulp was even lower and the D.P. higher than in (I) cooks. 1 table and 4 references. E.S.

CORROSION

BAISCH, S. J., and WHITNEY, ROY P. A bibliography of alkaline digester corrosion. Tappi 37, no. 4: 220-6A (April, 1954).

An annotated bibliography of alkaline digester corrosion is presented, covering articles published in this field through the year 1953. 113 references. R.A.S.

MIZELL, R. W., and SMITH, C. W. Status of digester corrosion in the South. Paper Mill News 77, no. 17: 12-13, 16 (April 24, 1954).

With particular reference to digester corrosion in the South and that experienced by Crossett Paper Mills at Crossett, Ark. (which has been operating for 16.5 years and is wearing out its third set of digesters), the authors describe the formation and activities of the TAPPI Digester Corrosion Subcommittee and discuss the findings published in recent pertinent literature here and abroad. The present status of the problem in the South seems to indicate that Inconel and Type 316 stainless steel are the most promising alloys, and that high tensile steels are not as good as ordinary steels for digester service. Rimmed steel at Crossett shows disappointingly high corrosion rates. As the studies are progressing, it becomes more and more apparent that solutions to this problem will be found only by co-operative efforts of the alkaline pulping industry, preferably on an international scale. 12 references. E.S.

SCHEIL, MERRILL A. New data revealed on kraft digesters. Pulp & Paper 28, no. 4: 90, 92 (April, 1954).

Some of the conclusions reached by the A. O. Smith Corp. on the potential performance and corrosion rates of various types of stainless steels and alloys in digester service are reported. All materials should be tested in the location of severest corrosion, which in general is at or just above the chip line in most digesters; the sample should be placed on the walls and not project out from the walls of digesters. Hastelloy Alloy F (I) has recently been used for lining sulfite digesters with excellent results. Severe tests with (I) samples were made in kraft digesters with various species of wood and under varying cooking conditions; all samples were free of pitting or corrosion, although in the liquid zone they became covered with calcite scale. Inconel seems quite satisfactory for the liquid zone, with reservations on its use in some types of vapor-zone corrosion of kraft digesters. High-oxygen carbon steel (trade name Oxyrim) is recommended for the construction of kraft digesters. The need for re-examination of the techniques for obtaining reliable corrosion rates in testing is stressed. 1 table and 1 illustration. E.S.

SHOUMATOFF, NICHOLAS, and TEEPLE, H. O. Comparative analysis of digester corrosion measurements. TAPPI Digester Corrosion Subcommittee summary report no. 1. Tappi 37, no. 4: 166-71 (April, 1954).

An industry-wide study was made of corrosion in alkaline digesters by numerical analysis of over 37,000 wall thickness measurements in 89 digesters in 12 different mills. It was found that ordinary carbon steel vessels installed from 1930-41 are corroding less rapidly than those installed since 1941; that high tensile carbon-silicon steels are corroding more rapidly than ordinary steels; that modern-rimmed steels do not corrode less rapidly than modern ordinary steel, but do corrode more rapidly than old-rimmed steel; that alloy-protected vessels corrode less rapidly than those of carbon steel; that the magnitude of corrosion variation possibly resulting from process variables was much less than expected; and that severe localized attack generally exists and is principally associated with physical action near the liquor level and the blow nozzle. 7 tables, 1 figure, and 12 references. E.S.

DIGESTERS

THOMAS, BEAUMONT. Carbon brick linings in alkaline pulp digesters. Tappi 37, no. 4: 174-6 (April, 1954).

The author presents the history and service record of 100 carbon-brick linings which have been installed in alkaline pulp digesters in North America during the last 22 years. Thin linings have not been as successful as the thicker ones, and their success has been dependent on several factors, which are discussed. Experience has taught the limits which must be maintained on lining thicknesses and on control of materials. Carbon-brick quality has been generally improved since the first linings were installed, and a variety of grades and types have been developed. In addition to close control of carbon-brick quality, efforts have been made to obtain the longest possible service life of these linings which the mortar joint material will allow. Service-life periods of 12 to 17 years have already been obtained. E.S.

DRYING—PAPER

TANZOLA, WILLIAM A., and WEIDMAN, JAY G. Film forming corrosion inhibitors also aid heat transfer. Paper Ind. 36, no. 1: 48-50, 66 (April, 1954).

Certain amines, such as octadecylamine or Permacol (I), inhibit corrosion by forming nonwettable layers over metal surfaces. The drier capacity of a paper machine could be increased by 5-10% by feeding (I) into the steam, which also caused a dropwise condensation of the steam on the metal surface thus insuring a more effective heat transfer. Case histories of various paper mills are cited. 3 figures and 7 references. L.E.W.

DYES AND DYEING

DRAPER, A. J. M. The reaction between certain acid dyes and size precipitate. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 34, no. 3: 497-507 (December, 1953); *cf.* B.I.P.C. 21: 464; 22: 661.

Previously recorded work indicated that some acid dyes are capable of dyeing size precipitate; in the present study this reaction was further investigated. Adsorption isotherms were plotted which showed that affinities of acid dyes for size precipitates vary. A dye of low affinity can be desorbed from the precipitate by dyes of higher affinity. In some cases, mixtures of dyes can be separated by this means. 3 tables, 3 figures, and 12 references. E.S.

FAURE, CH., and GIOT, F. A review dealing with the theory of paper dyeing. Assoc. tech. ind. papetière, Bull. no. 2: 31-7 (1954). [In French]

The conditions required for the fixation of acid, basic, direct, and pigment dyes on paper are outlined. The influences of the chemical components and the fine structure of the pulp and the structure of the dyes on their retention by pulp are discussed. 17 figures. L.E.W.

SIEGRIST, A. E. The use of optical brighteners in the paper industry. Das Papier 8, no. 7/8: 109-20 + 1 plate (April, 1954). [In German; English and French summaries]

Following a comparison of the optical action of white pigments, bluing agents, and optical brightening agents (I) on cellulosic materials, the history of the development of (I) (first observed by Krais in 1929) and their chemical constitution are described, with particular reference to the coumarins (not suitable for paper) and stilbene derivatives. A brief discussion on fluorescence is included. The final section of the article deals with the application of (I) in the paper industry either to the pulp in the beater, the web

on the paper machine, or the finished paper; the beater addition is the most generally used method. (I) can only be applied to pure sulfate or sulfite papers, irrespective of origin (conifers, hardwoods, straw, rag pulp, etc.). When groundwood pulp (10-20%) is present, the brightening effect disappears; this also holds for bleached groundwood. Waste paper can only be used when free from mechanical pulp and undyed; otherwise no brightening results. Fillers and white pigments do not interfere; in the presence of fillers with a yellowish or brown tinge (kaolin), additional amounts of (I) must be added. The paper-machine addition can be made on the wet or dry end, either alone or in combination with other agents, such as starch, dextran, casein, animal glue, gelatin, carboxymethylcellulose, and flameproofing agents; methylcellulose and methylstarch, on the other hand, annul the effect of (I). The size press and showers may also be used for application. The finished papers are preferably treated by dip dyeing, particularly lightweight papers; for fine or coated papers, calender dyeing can be employed. Examples of Uvitex (trade mark of CIBA) applications are listed. Wrapping papers treated with (I) become impermeable to ultraviolet rays, so that they can be used for the protection of perishable foodstuffs. Color matching during daylight presents no difficulties, whereas at night ultraviolet lamps are essential for the comparison of samples. The usual commercial instruments for measuring the whiteness of paper are not suitable for the evaluation of the effect of (I). 4 tables, 7 figures (3 colored), 3 pasted samples, and 14 footnotes.

E.S.

ENZYMES

SANDSTEDT, R. M., and GATES, R. L. Raw starch digestion: a comparison of the raw starch digesting capabilities of the amylase systems from four alpha-amylase sources. Food Research 19, no. 2: 190-9 (March-April, 1954).

There is a wide variation in the relative potential of amylase systems from various sources to digest raw starch. A comparison of malt, fungal, bacterial, and pancreatic enzyme systems at a constant level of α-amylase activity showed that their ability to digest raw starch was not proportional to the α-amylase. Used on the α-amylase basis, the pancreatic enzyme system was the most effective in digesting raw starch, followed in order by the malt, the bacterial, and the fungal; the pancreatic was 20 times as effective as the fungal. The optimum pH of each of the enzymes for raw starch digestion corresponded to that observed for the α-amylase activity of the particular system. The reducing value of the end products of raw starch digestion was different for each of the enzyme preparations approaching a constant value for any one preparation. The action of these preparations on raw starch was affected differently by the presence of a cationic detergent (Roccal). 7 diagrams and 16 references. E.S.

ESPARTO

ANON. Albardin. Papeterie 76, no. 1: 19, 21 (January, 1954). [In French] *cf.* B.I.P.C. 22: 905.

Reference is made to a Spanish variety of esparto, called Albardin *(Lygeum spartum)* which grows wild in many localities of the country and which can be used as a papermaking fiber in a manner similar to esparto. E.S.

FILES AND FILING

ANON. How to file engineering data and material. Paper Trade J. 138, no. 17: 15 (April 23, 1954).

A method of classifying engineering data and material is outlined giving seven major headings for general plant engineering departments and four for product design information; the major headings are designated by arabic numerals. Subheadings are denoted by lower-case letters; further arrangement can be made according to manufacturers' names. 2 tables. R.A.S.

FILTERING SPECIALTIES

BROWN COMPANY, *Berlin, N.H.* Filteraid gives clarity with high flowrate. Chem. Eng. 61, no. 4: 148, 150 (April, 1954); *cf.* B.I.P.C. 22: 906-7.

The advantages of Solka-Floc, made from wood cellulose in several particle sizes, as a filter aid are described. 2 illustrations. E.S.

FINANCE

DOBBS, PHILLIP. 1954 outlook for paper industry. Mag. Wall Street 94, no. 3: 178-81, 198-9 (May 1, 1954).

The paper and board business in 1954 has not been quite as high as the record 1953 production, but has been less susceptible to the general decline than most other industries. The unusual amount of new mill capacity which came into operation in 1953 or is scheduled to begin production in 1954 is feared to have the effect of lowering production rates until there is sufficient demand to absorb it. At worst, the industry over-all could anticipate a decline of about 7% in tonnage output this year compared with 1953. Comprehensive statistical data are given on the financial situation of 14 leading paper companies. 2 tables and 2 figures. R.A.S.

PAPER MILL NEWS. Annual reports of pulp and paper mills. Paper Mill News 77, no. 16: 108, 110, 112, 114, 118 (April 17, 1954); *cf.* B.I.P.C. 23: 719.

Summaries of the annual operational and financial reports of 45 pulp, paper, and board mills in the United States are presented. R.A.S.

FOLDING BOXES

ANON. 1954 carton competition attracts 6288 entries! Am. Boxmaker 43, no. 4: 3-6A, 8A, 10A, 12A, 14A, 18A, 20A, 22A, 24A, 26A, 28A, 30A (April, 1954); Modern Packaging 27, no. 8: 104-7, 168-70 (April, 1954); Fibre Containers 39, no. 4: 149-52 (April, 1954); Packaging Parade 22, no. 256: 114-17 (May, 1954); *cf.* B.I.P.C. 23: 636.

Winners in the Ninth Annual Folding Carton Competition sponsored by the Folding Paper Box Association of America are listed; 100 cartons were chosen from the 6288 entries. Numerous illustrations, particularly in the first reference. R.A.S.

FORESTS AND FORESTRY

AMIDON, G. B. Planning for sustained yield operations. J. Forestry 51, no. 10: 720-5 (October, 1953); *cf.* B.I.P.C. 23: 328.

This is the complete text of the paper of which the previous references presented only excerpts. E.S.

BØRSET, OLA. The heredity of forest trees and silviculture. Norsk Skogind. 8, no. 3: 97-102 (March, 1954). [In Norwegian; English summary]

The author reviews briefly several problems of heredity in forest trees of importance to the silviculturist, such as collection and use of seeds (the provenance problem), grading of plants, cleaning and thinning in young stands, and regeneration cuttings. The possibilities of increased growth in Norwegian forests by the introduction of more vigorous spruce strains from Germany are considered. 10 illustrations. E.S.

BROWN, WILLIAM J. Forestry and the growth of Kimberly-Clark Corporation. J. Forestry 51, no. 11: 792-4 (November, 1953).

The author describes the part which forestry played in the history of the corporation. In 1928, the first forester was employed in the Kimberly-Clark organization; he worked for Spruce Falls Power and Paper Co. at Kapuskasing. At present, there are 120 foresters in the employ of the company, 100 of them in administrative work and 20 in the forestry division under the general direction of the chief forester. The future of forestry in this company promises to offer as many opportunities as it has in the past. E.S.

CANADIAN PULP AND PAPER INDUSTRY. A review of Canada's pulpwood resources. Can. Pulp Paper Ind. 7, no. 4: 82, 84, 86, 88, 90, 92, 94, 96, 98, 100 (April, 1954).

The pulpwood resources of Canada as related to present and future demand are reviewed according to the various provinces under the titles: Quebec: present pulpwood consumption nears potential limit—7 tables and 1 illustration, p. 84, 86; Ontario: forest inventory reveals latest wood wealth figures—6 tables and 1 illustration, p. 88; British Columbia: sawmill residue basis of kraft production—5 tables and 2 illustrations, p. 90, 92; The Prairies: room for new mills seen by authorities—4 tables, p. 94, 96, 98; and Maritimes: forest inventories under way—1 table and 1 illustration, p. 100. R.A.S.

HALL, LLOYD D., TROWBRIDGE, K. S., and ALLEN, B. E. Intensive free seedling program at Panama City, Florida; North Carolina Pulp Company's seedling program; Future Farmers of America school forest project. Southern Pulp Paper Mfr. 17, no. 4: 84-8 (April, 1954).

The first author outlines the free seedling program of the International Paper Co. at Panama City, Fla., which will this year distribute 4 million pine seedlings to landowners, bringing the total seedlings planted in the area to 20 million. The North Carolina Pulp Co.'s program, described by the second author, shows a distribution of over one million seedlings in the 1952-53 season. The final author discusses the program of the Future Farmers of America and the Union Bag & Paper Corp., which includes over 1,500,000 pine seedlings allocated for planting on students' own property. R.A.S.

HATTERSLEY, JOSEPH G., and TEVIS, LLOYD, JR. A method of direct seeding in rodent infested areas of summer drought; paper does not protect seed from mice in northwestern California. J. Forestry 51, no. 8: 579; no. 12: 908-9 (August, December, 1953).

The first author describes successful direct seeding experiments in southern California employing a covering of newspaper in fall plantings and of a thinner toilet paper in later plantings. He claims that the paper suppressed the odor of the seeds so that rodents and birds did not find them. When the

experiments were repeated by the second author in the Douglas-fir region of California, they were an utter failure. E.S.

FORESTS AND FORESTRY—EDUCATION

NICHOLSON, G. W. E. Opportunities for strengthening forestry research and education. Pulp Paper Mag. Can. 55, no. 4: 130, 132, 136, 138, 140, 142 (March, 1954); Tappi 37, no. 4: 24A, 26A, 28A, 30A (April, 1954).

The author outlines his ideas on how the productivity of the forests can be materially increased by improving and strengthening research and education, both public education and that at forestry schools. R.A.S.

GLUE AND GELATINE

NATIONAL ASSN. OF GLUE MANUFACTURERS, INC. Animal glue in industry . . . Part 3. Am. Boxmaker 43, no. 4: 7, 18 (April, 1954); *cf.* B.I.P.C. 24: 622-3.

Additional information on the use of animal glue in the paper industry is presented, particularly covering applications in the boxmaking field. Hot and cold liquid glues are used in the manufacture of folding boxes, specialty boxes and fancy boxes covered with decorative papers, and convolute- and spiral-wound containers. R.A.S.

HARD WOODS

GRUEN, EDWARD D. Hardwood pulp in New England. Tappi 37, no. 4: 100A, 102A, 104A (April, 1954).

Data on the extent of hardwood use in the New England area are given. Hardwood pulp production (primarily birch, beech, and maple) in 1953 is estimated at 367,000 tons, equivalent to 22% of New England's total pulp production. The sulfate and soda processes have been the largest users of hardwoods in that region, whereas sulfite and groundwood mills, particularly the latter, have only just begun to use them. 2 tables and 2 diagrams. E.S.

HISTORY

ANON. From bags to riches; the story of the paper bag. The Digester (Union Bag & Paper Corp.) 18, no. 3: 10-11 (March, 1954); Paper & Twine J. 28, no. 1: 31-4 (March, 1954).

The origin of the paper bag, credited to John Francis Wolle of Bethlehem, Pa. who was granted a patent in October of 1852 for a machine to make paper bags, is discussed. In 1869, the same Wolle, his brother August, a few of the other leading makers of machines, and interested financiers combined to form a company called the Union Paper Bag Machine Co. They did not make or sell bags, but manufactured the machines which they sold to others who made the bags. It took years of exhausting missionary work to get the production of bags up to 1000 bags/day. This is contrasted with the daily output of 35 million bags of the Savannah plant of the Union Bag & Paper Corp. today; the great diversity of these bags is mentioned. 2 illustrations. R.A.S.

GREEN, ROBIN. The home of modern paper. Paper Making 72, no. 4: 11-13 (Winter, 1953/54).

The history of the rise of papermaking in the Loose Valley in Kent, England is traced; in a distance of about 2.5 miles there have been from very

early times at least 12 mills. The mills were originally flour mills, were then connected with the wool trade in the 16th century, and one (at Lower Tovil) was first recorded as a paper mill about 1740. James Whatman, who introduced the beater in England, had two mills in this valley; other individuals mentioned are T. and J. Hollingsworth and W. and R. Balston. 1 map.
R.A.S.

H-ION CONCENTRATION

MATAGRIN, AM. pH in papermaking. Papeterie 76, no. 1: 23, 25, 27-9, 31; no. 2:84-7, 89, 91, 93; no. 3:165-9 (January-March, 1954). [In French]

The significance of pH and its control at various stages of the papermaking process (including raw materials, cooking and purification processes, bleaching, sizing, loading, dyeing, sheet formation on the paper-machine wire, the manufacture of special papers or boards, white water, and the evaluation of paper permanence) are reviewed. 49 references. L.E.W.

INDICATORS AND TEST PAPERS

ANON. Thaw indicator for frozen foods. Packaging Parade 22, no. 255: 62 (April, 1954).

An indicator which gives evidence of the formation of moisture that occurs when a frozen product thaws consists of an outer sheet obscuring the printed word "thawed" on the cardboard box or wrapper. The sheet is of a material which becomes transparent when in contact with moisture, thus allowing the word "thawed" to become visible. 2 illustrations. R.A.S.

LIGNIN

KÜRSCHNER, KARL. The aromatic components in native lignin. Faserforsch. u. Textiltech. 4, no. 11: 461-4 (November, 1953). [In German]

To determine whether protolignin as it occurs in the plant is aromatic or carbohydrate-like in structure, pre-extracted sprucewood was extracted for two hours under reflux under strictly anhydrous conditions with 100% ethanol and 100% nitric acid containing a small amount of dinitrogenpentoxide. The cooled mixture was filtered, the filtrate poured into water, and the precipitated nitrolignin filtered off and weighed. From the yield (after subtracting 11% of its weight for the nitro groups introduced) it is calculated that sprucewood contains about 8.5% and beechwood about 3.25% aromatic lignin. The remainder of the lignin as determined by strong mineral acids is present as anhydrous polysaccharides which are converted during the isolation into "isolated lignin." It is concluded that the isolated lignin is formed from methylated polysaccharides by the addition of water according to the following equation: $(C_5H_7O_3 \cdot OCH_3)_n + nH_2O \rightarrow nC_6H_{12}O_5$ (monomer) $\rightarrow$ lignin $+ H_2O + CH_3CO_2H$. When water is excluded in the extraction with nitric acid, this reaction cannot take place and only the original aromatic lignin is extracted. 1 table, 2 figures, and 3 references. F.E.B.

MEREWETHER, J. W. T. Studies on the lignin of *Eucalyptus regnans* F. Muell. X. The ethanolysis of an isolated alkali lignin. Australian J. Chem. 7, no. 1: 75-82 (February, 1954); *cf.* B.I.P.C. 24: 198.

To find a clue to the nature of the difference between the dioxane-ether-insoluble alkali lignin A (I) and the protolignin of *Eucalyptus regnans*

F. Muell., ethanol lignin A (II) was prepared from *E. regnans*. (II) was hydrolyzed by mineral acid to give an ethoxyl-free ethanol lignin A (III) which, with some of its derivatives, was compared with (I) and its corresponding derivatives. (III) differed only slightly from (I) in its analytical composition. There were, however, some chemical differences, since (I) has fewer reactive hydroxyl groups than (III) and, whereas *p*-nitrophenylhydrazine reacts with (I) and (III) in the same way, phenylhydrazine combines with (I) to a greater extent than with (III). To study these differences further, (I) was subjected to an ethanolysis with ethanol containing 0.5% hydrochloric acid giving an ethanol-soluble, ether-insoluble alkali lignin A (IV), in addition to an ethanol-insoluble, an ether-soluble, and a mixed fraction. (IV) had the composition $C_{68}H_{76}O_{25}$ with one ethoxyl and nine methoxyl groups. The principal difference between (IV) and (II) lies in the content of ethoxyl groups of which (IV) has only one and (II) possesses two. (IV) contains six hydroxyl groups, whereas (I) and (II) each contain seven; of these hydroxyl groups three in (II), only one in (IV), and three in (I) are of an acidic nature. From the analyses of the derivatives of (I), (II), and (IV), some inferences are drawn as to the structure of protolignin. 3 tables and 7 references. F.E.B.

TIBENHAM, F. J., and GRACE, N. S. Compounding natural rubber with lignin and humic acid. Ind. Eng. Chem. 46, no. 4: 824-8 (April, 1954).

The incorporation of alkali lignin into rubber compounds by coprecipitation from latex has previously been shown to yield vulcanizates with tensile strengths, hardness, and tear resistance comparable with those of black-reinforced compounds. The properties of the vulcanizate depend, however, on the process of coprecipitation used. Treatment of the lignin with hexamethylenetetramine in the presence of the rubber yields a vulcanizate in which tensile properties and hardness comparable with those of a black-reinforced compound are combined with the resilience of a pure gum compound. Lignosulfonic acid resulting from the acid cooking process has not shown the same promise as alkali lignin as a reinforcing filler in rubber. By an ion-exchange technique it may be modified to yield results similar to those given by alkali lignin. A material chemically related to lignin and potentially abundant is humic acid, obtained by the alkaline extraction of weathered outcrop coal. This material behaves in rubber much like alkali lignin, yielding products with the same general level of properties. 6 tables and 17 references. E.S.

TRAYNARD, PH., and AYROUD, A. M. The existence of carbohydrate units in certain lignin molecules. Bull. soc. chim. France no. 3: 345-7 (March, 1954).

Poplarwood (I) was chlorinated in carbon tetrachloride (*cf.* B.I.P.C. 24: 221). The well-washed residue was then extracted with alcohol, the extract concentrated *in vacuo* and treated with water, thus forming a precipitate (II) which amounted to 11% of the weight of (I). The fibrous residue was extracted with 1% sodium hydroxide at 40°C., and the extract treated with hydrochloric acid, giving a precipitate (III) which represented about 8% of (I). (II) and (III) were then subjected to a series of elaborate purifications so as to remove the common hemicelluloses; these purifications are shown in two detailed flowcharts. Purified (II) and (III) when treated one hour with boiling *N* sulfuric acid yielded no sugars (shown by the absence of sugar spots on paper chromatograms). However, after extending the hydrolyses from four to 10 hours, xylose, arabinose, and/or galactose spots were detected chromatographically. The extreme stability of (II) and (III) indicates that the sugar units are firmly bound to the lignin and are not present in the

form of long chains such as those which occur in the usual type of hemicellulose. 1 table, 2 figures, and 4 references. L.E.W.

LIGNIN—THIOLIGNIN

ENKVIST, TERJE, and ALFREDSSON, BO. A comparison of sulfate, soda, and hydrosulfide cooks of aspenwood. Svensk Papperstidn. 57, no. 5: 159-61 (March 15, 1954). [In German; Swedish and English summaries]

Comparative cooks of aspenwood (I) and sprucewood (II) with sulfate, soda, and hydrosulfide at pH 7 show that (I) lignin dissolves with considerably greater ease than that of (II) (*cf.* B.I.P.C. 20: 321-2). (I) is almost completely delignified by a sulfate cook at 140°C. lasting for five hours. A comparison of the results of soda and sulfate cooks demonstrates the favorable effect of the sulfur compounds in the cooking liquor not only in the case of (II), but also in (I). (I) cooked with hydrosulfide at pH 7 gives a yield of alcohol-soluble thiolignin which is about twice as large as the percentage obtained from (II). The thiolignins of both wood species have approximately the same high sulfur content (10-20%); however, the methoxyl content of the thiolignin of (I) is somewhat higher than that from (II). 1 table, 2 figures, and 10 references. E.S.

MACHINERY

ANON. The Ateliers Neyret Beylier combine a century of experience with ultramodern equipment. Papier, carton et cellulose 3, no. 1: 85-8 (March-April, 1954). [In French]

The French foundry and machinery-manufacturing company at Grenoble celebrates its 100th anniversary in 1954. A brief history of the company is given, and its present activities (which include the manufacture of papermill machinery) are described; the entrance on the South American export market is contemplated. 7 illustrations. E.S.

MACHINERY—CONVERTING MACHINERY

ANON. Lhermite machines for cutting and scoring board. Papier, carton et cellulose 3, no. 1: 89 (March-April, 1954). [In French]

A French construction of a circular board slitter combined with a scoring machine is described; the scoring device can be lifted and the slitter used for this purpose only. The necessary adjustments require no more than a few seconds. 5 figures. E.S.

THE THRISSEL ENGINEERING COMPANY LTD. Automatic forming of corrugated cushioning pads. Brit. Packer 16, no. 3: 179-80 (March, 1954).

Two new automatic machines of the company, a hopper-fed slitting and a folding and gluing unit, are described; the machines form pads composed of layers of corrugated board from flat blanks. 7 figures. R.A.S.

MACHINERY—CUTTERS

MILLS, GEORGE J. Paper cutting. Tappi 37, no. 4: 121-4A (April, 1954).

Requirements of cutting machines are listed, and directions are given for

the proper maintenance of the cutter, most suitable cutting procedures for different kinds of paper, jogging, carrying lifts of large sheets, and trimming pamphlets. 1 table. E.S.

MACHINERY—FELTS

PAPER TRADE JOURNAL. Experience with synthetic fibres in felts. Paper Trade J. 138, no. 18: 22 (April 30, 1954).

A brief survey of paper and board mills as to their experience with felts containing varying percentages of two synthetic fibers, nylon and Dacron, is presented. Typical replies are given from a tissue mill, book-paper mill, high-grade cylinder board mill, kraft-paper mill, and a large mill making a wide range of printings, writings, etc. All report prolonged felt life. R.A.S.

MACHINERY—PAPER MACHINE

SCHMIDT, KARL. A modern newsprint machine. Svensk Papperstidn. 57, no. 5: 166-70 (March 15, 1954). [In German]

Details of a high-speed newsprint machine constructed by Voith for a German mill and the operating experience during the first 15 months after installation are given. The new machine (which replaces two obsolete ones) is built for an ultimate speed of 550 m./minute and a daily production of 180 tons. The machine started at 380 m. and now runs regularly at a speed of 465-475 m./minute with an increase in output from 110 to 150 tons/day. 1 table and 8 figures. E.S.

SHUKHMAN, F. G. High-speed paper machine problems. Bumazh. Prom. 28, no. 12: 10-16 (December, 1953). [In Russian]

For abstract *cf.* C.A. 48, no. 7: 4219 (April 10, 1954). 1 table and 12 figures. E.S.

MACHINERY—PIPING

ZIEGENBUSCH, C. W., and JONES, M. V. Maintenance of pipe lines—internal cleaning. Tappi 37, no. 4: 172-3; discussion: 173-4 (April, 1954).

The problem of keeping the numerous pipe lines in pulp and paper mills safely free of deposits is discussed. The mechanical, chemical, hydraulic, and special methods of pipe cleaning most commonly used and the mechanical applications of the devices involved are described. E.S.

MACHINERY—PULPERS

A. The Starmix as laboratory equipment. Wochbl. Papierfabrik. 82, no. 4: 114 (Feb. 28, 1954). [In German]

The suitability of the Starmix (originally designed for kitchen uses) for duplicating the process taking place in pulpers in the laboratory is outlined. 1 table and 1 illustration. E.S.

JÖRG, —. Low- or high-consistency disintegration? Wochbl. Papierfabrik. 82, no. 2: 41 (Jan. 31, 1954). [In German]

The advantages of low-consistency disintegration of pulp prior to screening are pointed out, with particular reference to a disintegrator designed by Wultsch. 1 flowsheet. E.S.

MACHINERY—PUMPS

HAGBARTH, OP. The construction of centrifugal pumps for corrosive liquids. Svensk Papperstidn. 57, no. 5: 171-8 (March 15, 1954). [In Swedish]

Important factors in centrifugal-pump constructions for handling corrosive liquids, with particular reference to available constructional materials, are discussed. 22 figures. E.S.

MACHINERY—REFINERS

DOBROVOL'SKIĬ, D. S. Beating pulp in conical refiners. Bumazh. Prom. 28, no. 12: 5-6 (December, 1953). [In Russian]

For abstract *cf.* C.A. 48, no. 7: 4219 (April 10, 1954). 2 tables. E.S.

MÜLLER-RID, W., and STARK, A. Beating with disk refiners. Wochbl. Papierfabrik. 82, no. 3: 75-84 (Feb. 15, 1954). [In German]

The authors show that the papermaking qualities of kraft and sulfite pulps can be influenced by the operating conditions of a disk refiner (I). Whereas kraft responded well to a high beating pressure and relatively slow speeds of rotation, the opposite was true in the case of sulfite pulps. The effects of altering stock density and throughput on sheet properties were also studied. Tear-through and folding endurance of the sheet were quite sensitive to changes in operating conditions of (I), whereas breaking length and burst were but little affected. Contrary to common belief, high beating degrees could be obtained with (I), which was found suitable for refining a variety of stocks. The findings of the authors are not in complete agreement with those of Wultsch and Aflenzer (*cf.* B.I.P.C. 24: 348). 3 tables, 25 figures, and 10 references. L.E.W.

MACHINERY—ROLLS

ANON. A new instrument for measuring the crowning of rolls. Wochbl. Papierfabrik. 82, no. 1: 11 (Jan. 15, 1954). [In German]

The instrument (manufactured by Karl Frank, Weinheim-Birkenau) is described briefly; it can be successfully applied to the top, side, or bottom of the roll to be measured, so that the crowning of rolls with only partially available free surface can be determined. 1 illustration. E.S.

MACHINERY—VORTEX-TYPE DIRT SEPARATOR

WILEY, A. L., ADAMS, R. L., and STAFFORD, A. W., JR. The use of Centri-Cleaners and Vortraps on semichemical pulp. Tappi 37, no. 4: 164-6 (April, 1954).

The development of the Centri-Cleaner-Vortrap system for cleaning semichemical pulp is described. The effect of feed consistency on the percentage rejects from the Centri-Cleaners is discussed. The system consisting of primary and secondary Centri-Cleaners followed by Vortraps as tertiary cleaners rejected only 0.3% of the feed. The primary and secondary Centri-Cleaners, as finally developed, produced stock of satisfactory cleanliness with a reject rate of about 10% of the feed. It was found that the rejects from the secondary Centri-Cleaners could be used satisfactorily in the kraft system. This made it unnecessary to use the Vortraps. 6 figures. E.S.

MASONITE

ALLEGRETTI, JOSEPH J. Masonite's place in the competitive picture. J. Forest Products Research Soc. 4, no. 2: 27-8A; discussion: 28A (April, 1954).

The author stresses that the hardboard products of the Masonite Corp. should be considered as an entirely new type of wood product rather than a substitute for wood. R.A.S.

MATERIALS HANDLING

STRUBE, HARRY L. Conveyors & elevators. Chem. Eng. 61, no. 4: 195-210 (April, 1954).

A comprehensive report on the different conveyor and elevator constructions used in moving bulk materials (I), their speeds and capacities, and the factors which govern their selection is presented. A table listing the characteristics of (I), including a number used in pulp and paper manufacture, is appended. 9 tables and 38 figures. E.S.

MATERIALS OF CONSTRUCTION

ROLAND, PEDER. Grinding disks for the production of wallboard. Norsk Skogind. 8, no. 3: 94, 96 (March, 1954). [In Norwegian; English summary]

The following factors are considered important in the evaluation of grinding disks used in the manufacture of wallboard: the life time of the disks, their production capacity, the quality of the pulp produced, and the price of the disks. The most important consideration is the cost of the disks as compared with their output/time unit. Experiments have shown that it is not the degree of hardness of the construction material which counts, because some disks had to be replaced on account of their unsatisfactory output without being worn out; the solution of the problem consisted in the manufacture of a cast-iron disk with a structure of hard and resistant particles embedded in a less resistant fundamental material. During operation, the soft and less resistant parts in the structure will wear off, whereas the hard and more resistant elements remain, forming sharp contours which are well fitted for grinding. Each casting is produced under carefully controlled conditions. E.S.

MICROBIOLOGICAL TESTING

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. Fungus resistance of paper and paperboard. Tappi 37, no. 4: 174-6A (April, 1954).

The text of TAPPI Tentative Standard T 487 sm-54 is presented which covers a method for determining the resistance to fungus growth of paper and paperboard, particularly those types which have been given a fungus-resistant treatment. The apparatus and materials, sterilization of equipment and media, test organisms, the preparation of the inoculum, test specimen and procedure, incubation, and method of reporting are covered. 3 references. E.S.

MICROSCOPY

ROLLINS, MARY L. Some aspects of microscopy in cellulose research. Anal. Chem. 26, no. 4: 718-24 (April, 1954).

MASONITE

ALLEGRETTI, JOSEPH J. Masonite's place in the competitive picture. J. Forest Products Research Soc. 4, no. 2: 27-8A; discussion: 28A (April, 1954).

The author stresses that the hardboard products of the Masonite Corp. should be considered as an entirely new type of wood product rather than a substitute for wood. R.A.S.

MATERIALS HANDLING

STRUBE, HARRY L. Conveyors & elevators. Chem. Eng. 61, no. 4: 195-210 (April, 1954).

A comprehensive report on the different conveyor and elevator constructions used in moving bulk materials (I), their speeds and capacities, and the factors which govern their selection is presented. A table listing the characteristics of (I), including a number used in pulp and paper manufacture, is appended. 9 tables and 38 figures. E.S.

MATERIALS OF CONSTRUCTION

ROLAND, PEDER. Grinding disks for the production of wallboard. Norsk Skogind. 8, no. 3: 94, 96 (March, 1954). [In Norwegian; English summary]

The following factors are considered important in the evaluation of grinding disks used in the manufacture of wallboard: the life time of the disks, their production capacity, the quality of the pulp produced, and the price of the disks. The most important consideration is the cost of the disks as compared with their output/time unit. Experiments have shown that it is not the degree of hardness of the construction material which counts, because some disks had to be replaced on account of their unsatisfactory output without being worn out; the solution of the problem consisted in the manufacture of a cast-iron disk with a structure of hard and resistant particles embedded in a less resistant fundamental material. During operation, the soft and less resistant parts in the structure will wear off, whereas the hard and more resistant elements remain, forming sharp contours which are well fitted for grinding. Each casting is produced under carefully controlled conditions. E.S.

MICROBIOLOGICAL TESTING

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. Fungus resistance of paper and paperboard. Tappi 37, no. 4: 174-6A (April, 1954).

The text of TAPPI Tentative Standard T 487 sm-54 is presented which covers a method for determining the resistance to fungus growth of paper and paperboard, particularly those types which have been given a fungus-resistant treatment. The apparatus and materials, sterilization of equipment and media, test organisms, the preparation of the inoculum, test specimen and procedure, incubation, and method of reporting are covered. 3 references. E.S.

MICROSCOPY

ROLLINS, MARY L. Some aspects of microscopy in cellulose research. Anal. Chem. 26, no. 4: 718-24 (April, 1954).

Newsprint has been successfully prepared from 100% straw pulp. However, at the high speeds of newsprint machines (200 m./minute is considered the economical minimum), the parenchyma cells and silica of the straw pulp irremediably foul the Fourdrinier wire within a few hours. As a solution the author suggests small units in place of the huge newsprint mills operating with greatly reduced personnel and comparatively light machinery at speeds not exceeding 115 m./minute and whose output could be readily absorbed by two papers in the vicinity. The only problem would be the price which the press would be willing to pay for this paper. 1 table. E.S.

SPROULL, REAVIS C. Newsprint from culled hardwoods. J. Forest Products Research Soc. 4, no. 2: 89-91 (April, 1954).

Following a review of pertinent literature relative to the use of hardwood for newsprint, the details of groundwood pulp preparation and manufacture of paper in current tests conducted at the Herty Foundation are related. The results indicate that newsprint with good physical and printing properties can be made using oak groundwood in blends with gum groundwood and bleached southern kraft; however, more data are required to establish the best blend and economic boundaries. 4 tables, 3 illustrations, and 11 references. E.S.

NOISE

SCHWEISHEIMER, W. Cut down noise in paper mills. Pulp Paper Mag. Can. 55, no. 4: 168, 172 (March, 1954); Paper Ind. 36, no. 1: 64 (April, 1954).

The effects of industrial and office noise in terms of fatigue and inefficiency are discussed. An increase of approximately 9% in production capacity was effected by quieting machine noises in some plants. Screening workers and placing those particularly susceptible in quieter surroundings also increased efficiency. R.A.S.

NOMOGRAPHIC CHARTS

ZARS, P. H. Novel ink mileage nomograph. Am. Ink Maker 32, no. 4: 29-30, 69 (April, 1954).

An ink-mileage nomograph is presented which gives a method of reporting the relative value of an ink in advance of actual mileage determinations by correlating the selling price per pound of the ink, the specific gravity, and the relative strength, obtained from a volumetric bleach test of the two inks which are being compared. 1 diagram. R.A.S.

ODORS

K. J. B. A rose by any other name . . . Ind. Eng. Chem. 46, no. 4: 17-18A, 20A (April, 1954).

Problems involved in industrial odor masking are discussed. 1 diagram. E.S.

OXIDATION—REDUCTION

MATAGRIN, AM. The oxidation-reduction potential. Papeterie 75, no. 10: 679, 681, 683-5; no. 12: 808-11, 813 (October, December, 1953). [In French]

The author reviews the nature of the oxidation-reduction potential (rH); its relationship to pH; electrometric, colorimetric, and photoelectric methods

of measurement; and applications of rH determinations outside the paper industry. 2 tables and 32 references. E.S.

PACKAGING

ANON. Big business in cylindrical containers. Paper Sales 14, no. 4: 20-1, 59-60 (April, 1954).

A description of the cylindrical container is given; the liquid-tight and leakproof properties of the container have made it adaptable for a great variety of food products. Potential users of cylindrical paper containers are considered. 4 illustrations. R.A.S.

ANON. Dry-packed foods. Modern Packaging 27, no. 8: 86-92, 170, 172, 174, 176 (April, 1954).

The field of dry-packed foods is probably the biggest single market of packaging; the estimated annual packaging bill is $1.5 billion. The low cost of the foods, high competition between brands, the frequent necessity for a high degree of protection and, in addition, the ability to withstand only the lowest packaging costs have been incentives for research which has contributed more to the development of improved methods of protective packaging at low cost than any other field. Recent developments in materials (particularly transparent) and machinery are discussed. 17 illustrations. R.A.S.

ANON. Packaging automation; mechanized salt packaging line. Packaging Parade 22, no. 255: 102-5 (April, 1954).

The packaging line at Diamond Crystal Salt Co., St. Clair, Mich. runs at a typical speed of 130 packages/minute from the fabrication and filling of packages to the discharge of sealed cases. The forming, attaching of bottoms, filling, completing, labeling, and packing of the cylindrical containers, formed from three plies (one asphalt treated, one adhesive coated, and one plain stock) are described. The most recent installation is a machine for forming, positioning, and stapling the aluminum pouring spouts. 12 illustrations. R.A.S.

BENDIX AVIATION CORPORATION. *Bendix Products Division, South Bend, Ind.* Award winning pack in action at Bendix. Packaging Parade 22, no. 255: 172, 174-6 (April, 1954).

To furnish adequate protection for its products of aircraft manufacture, the company is using a package which consists of a corrugated box, a liner used with heavier items, and die-cut pads for the top and bottom outlined to fit the surface configuration. Each unit is placed in a polyethylene bag to protect it from dust before insertion in the box; steel strapping is applied to complete the package. 8 illustrations. R.A.S.

HARDENBURG, R. E. Government tests show value of produce prepackaging. Am. Paper Merchant 51, no. 4: 20-2, 65 (April, 1954).

The author presents a general discussion of the prepackaging of fruits and vegetables in plastic films, including the necessity for using only good-quality produce and refrigeration, the choice of the correct packaging material, and film ventilation. 1 table, 3 illustrations, and 2 references. R.A.S.

PAPER—COATED

DAVIS, D. W., FORCEY, G. W., and HELMS, J. F. Protective

paper coatings. Paint Varnish Production 43, no. 7: 19-25 (1953).

Coating materials applied to paper for protection and to impart strength, heat sealability, gloss, and scuff resistance are discussed as to chemical types, methods of application, coating properties, and end uses. Surface smoothness and absorbency of the paper base must be considered in the selection of a suitable material; base papers must be adapted to the lacquer, hot-melt, or dispersion coating to be applied. The various coatings described include waxes (paraffin and microcrystalline), cellulosic derivatives (cellulose nitrate, ethylcellulose, cellulose acetate, and cellulose mixed esters), vinyl polymers and copolymers (polyvinyl chloride, polyvinyl acetate, copolymers of vinyl chloride-vinyl acetate, polyvinylidene chloride, polyvinyl alcohol, polyvinyl aldehydes, polystyrene, acrylic resins, polyethylene, and polyester resins), proteins and related compounds (zein and polyamides), natural and synthetic rubber (cyclicized rubber, chlorinated rubber, polyisobutylene, isobutylene-diolefin copolymer, butadiene-stryene copolymer, styrene-isobutylene copolymer, and other rubber derivatives), and miscellaneous coating materials. New developments in the use of synthetic plastics and the future outlook are summarized. R.A.S.

HAGEN, GUSTAV. The manufacture of paper coated with plastic compounds. Allgem. Papier-Rundschau no. 7: 280-90 (April 5, 1954). [In German] *cf.* B.I.P.C. 24: 636.

In a comprehensive review the author outlines the requirements of various types of coated papers with special reference to printing paper, enameled colored paper, wallpaper, velour paper, sensitized papers (ozalid and blueprint), and wrappings and protective papers. Data are given for the application of such coatings and their comparative effects on the permanence, lightfastness, heat resistance, resistance to cracking, tensile strength, and elongation of the sheet. The effects of the following factors on the various coated papers are tabulated: water, acids, alkalies, fats and oils, aliphatic hydrocarbons, esters, and ketones. Gas and water-vapor permeabilities are also listed. The coating substances used included cellulose esters and ethers, hydrochloride-treated rubber, polyethylene, polyvinyl chloride, polyamides, and various products formed by copolymerization. 4 tables, 1 diagram, and 2 references. L.E.W.

PAPER—DEFECTS

CALKINS, C. R. Dimensional stability of paper. Tappi 37, no. 4: 163-5A (April, 1954).

The author stresses the need for dimensional stability of paper not only from the angle of printing but also for industrial purposes (templet paper, recording charts, business-machine cards, wallboard tape, etc.). The effects which changes in moisture content have upon the dimensions of a sheet of paper are outlined, as well as the causes of this instability. The possible ways for obtaining lower expansivities are listed; for general application at reasonable cost the following are considered the best approaches: the selection of a strong fiber which requires less bonding for a given strength; optimum machine conditions; a size-press treatment with a suitable resin; and, if feasible, a secondary waxing or similar treatment. E.S.

TONGREN, JOHN C. Dimensional stability of bond and printing papers. Tappi 37, no. 4: 166-8A (April, 1954).

In studying the expansion and contraction of sulfite papers of different basis weight and furnish made on the same machine with similar stock preparation in a period of 10 days, a striking similarity in dimensional changes with

changes in R.H. was found. A laminating paper made from purified western sulfite with no sizing material and beaten fairly hard in the beaters showed a somewhat greater dimensional change, but the difference in expansion between the center of the machine paper and its edges was far less. Purified fibers drain and dry easily and are not subject to any great degree of shrinkage at the edges, whereas bleached sulfite which has not received any purifying treatment contains hemicellulosic material and gives a sheet on the machine which is definitely subject to shrinkage at the edges. Certain steps might be taken at the mill for reducing expansion during paper manufacture (use of less reactive pulp, suitable stock preparation, slack draws, gradual drying, suitable felt tension, etc.); however, these precautions will not always be feasible in practice. The addition of synthetic resins to the furnish may provide an answer to the problem, provided they do not interfere with other properties of the paper. 7 tables. E.S.

PAPER—OPTICAL PROPERTIES

HARRISON, V. G. W. The optical properties of paper. Intern. Bull. for the Printing and Allied Trades no. 67: 31-4; discussion: 35 (January, 1954).

The author discusses the principal optical properties of paper (opacity, color, and gloss) and the limitations of some methods and instruments used for their evaluation. 5 figures and 7 references. E.S.

PAPER—PERMANENCE

NEDERVEEN, G. VAN, and ROYEN, A. VAN. The permanence of different types of pulp. (I). Papierwereld 7, no. 11: 323-31 (June, 1953). [In Dutch; English summary]

The permanence of 21 different bleached pulp samples (rags, and softwood and hardwood sulfate and sulfite pulps) has been studied by artificial aging and determination of the loss in folding endurance. The method originally described by Rasch (*cf.* B.I.P.C. 2: 133) was found satisfactory for this purpose. The authors conclude that there is no essential difference between the permanence of rags and wood pulps. Some grades of bleached sulfate softwood pulps show a durability which is practically equal to that of new rags. Bleaching with chlorine dioxide seems to improve the permanence in particular. Cotton linters, however, were found to be the most permanent material. 3 tables, 2 figures, and 7 references. E.S.

PAPER—SURFACE PROPERTIES

VOYUTSKIĬ, S. S., VOLOKITINA, N. A., and ZAĬONCHKOVSKIĬ, A. D. The influence of the hydrophobic surface of fibers on the properties of paper and paper board. Bumazh. Prom. 28, no. 12: 6-9 (December, 1953). [In Russian]

For abstract *cf.* C.A. 48, no. 7: 4219 (April 10, 1954). 5 tables. E.S.

PAPER AND PULP INDUSTRY

ANON. The paper industry of Greece. Svensk Papperstidn. 57, no. 5: 182 (March 15, 1954). [In Swedish]

At present there are 16 mills in Greece which produce paper and board; the eight comparatively large ones are listed. The output of the other eight mills amounts to no more than 0.5-2 tons/day. Data on consumption and imports are given. 2 tables. E.S.

ANON. Review of the pulp and paper industry in BC—1953. Can. Pulp Paper Ind. 7, no. 4: 124, 126 (April, 1954); *cf.* B.I.P.C. 24: 640.

Completed mill-expansion projects and speedups during 1953, proposals for new mills, and the general status of the industry in the province and its outlook are discussed. The largest single factor influencing the trends in coming years will be the market conditions of the world. 2 illustrations. E.S.

BAYER, —. The paper industry in Argentina. Wochbl. Papierfabrik. 82, no. 1: 19-21 (Jan. 15, 1954). [In German]

Data for the pulp, paper, and board industries of the country are given, including important mills; raw materials; imports; production of paper, board, and newsprint; paper machines; financial problems; and future plans. 3 tables. E.S.

BOYCE, CHARLES W. Wood pulp, pre and postwar. Paper Mill News 77, no. 16: 95, 97, 106, 119 (April 17, 1954).

The growth in production of wood pulp in the world is reviewed from the introduction of the wood-pulp processes in the last part of the 19th century to an expected 45 million-ton production by 1960. Changes in production are summarized, including wood species used, high-yield processes, the world pattern of pulpwood sources, chemical and mechanical pulps, and improvement in grades produced. Data are given on consumption, production, exports, and imports, comparing particularly the prewar average (1936-1938) with the postwar average (1950-1952) for all countries, except the Soviet countries and West Germany. 5 tables. R.A.S.

BUCHHOLZ, E. The paper industry of the USSR. Das Papier 8, no. 7/8: 153-5 (April, 1954). [In German]

The development of the pulp and paper industry since 1932 is briefly reviewed. Soviet Russia now possesses approximately 90 large pulp and paper mills of which quite a number produce over 100,000 tons per year. The annual production is estimated to amount to 2.3 million tons. Although production has never been able to meet all requirements, the industry is gradually expanding and developing. The large forested area (about one third of the forests of the world, 75% of which consist of mature coniferous stands) offers excellent possibilities. 2 references. E.S.

CANADIAN PULP AND PAPER INDUSTRY. Canadian pulp and paper industry review. Can. Pulp Paper Ind. 7, no. 4: 39-42, 44, 46, 48, 50 (April, 1954).

A review of the pulp and paper industry of Canada is presented under the headings: Expansion, modernization programmes continue during 1953—1 table and 1 illustration, p. 39-40; Quebec's newsprint mills establish output record—1 table and 1 illustration, p. 40-1; Ontario: co-operation keynotes industry's activities in 1953—1 illustration, p. 42, 44; British Columbia: major mill programmes completed during year—1 illustration, p. 44, 46; Maritimes: a major influence on prosperity—1 illustration, p. 46, 48; Newfoundland: private companies explore timber wealth—1 illustration, p. 48, 50; and The Prairies: new developments seen during 1953—1 illustration, p. 50. R.A.S.

KORDES, FRANZ-JOSEF, SCHMIDT, ERHARD, and KÖTHER, WERNER. The development of the foreign paper trade [of Germany]

Allgem. Papier-Rundschau no. 6: 230-41 (March 20, 1954). [In German]

The first author discusses the imports of papermaking raw materials, papers, and boards in the year 1953; the second author deals with exports of the pulp and paper industry during the same period; and the third author reviews the slow but constant increase in the exports of converted paper and graphic-arts products from Germany. Detailed statistical data are included. 13 tables and 9 diagrams. E.S.

LAGERLOEF, ERIC G. A half century of progress in the paper industry. Paper Mill News 77, no. 16: 48, 50, 119 (April 17, 1954).

The development and growth of the paper industry since the turn of the century is reviewed; paper production in this period has risen from 1,733,482 tons to 13,010,418 tons in 1951, the peak year. Considered the most important development is the growth of the kraft paper and board industry in the South since 1936. The industry's importance in foreign trade and in the United States economy are discussed. 4 tables. R.A.S.

NEUBRECH, W. LEROY. Pulp, paper, and board; economic review. Industry Report. Pulp and Paper 10, no. 1: 3-48 (March, 1954); Paper Mill News 77, no. 16: 52, 54, 56, 58, 60, 62, 64, 66, 68, 71, 74, 76-7, 79-80, 83, 85, 89-90, 92, 94 (April 17, 1954); Tappi 37, no. 5: 70A, 72A, 74A, 76A, 78A, 80A, 82A, 84A, 86A, 88A, 90A, 92A, 94A, 96A, 98A (May, 1954); Paper Ind. 36, no. 1: 58-9 (April, 1954). [Abridgement] *cf.* B.I.P.C. 23: 737.

The annual economic review of the pulp, paper, and board industries for 1953 is presented. Numerous graphs and statistical data. R.A.S.

PAPER MILL NEWS. Chronological review. Paper Mill News 77, no. 16: 124-8, 130, 132, 134, 136, 143 (April 17, 1954); *cf.* B.I.P.C. 23: 737.

Important events in the pulp and paper industry occurring during the period from April, 1953 to March, 1954 are listed chronologically. R.A.S.

VINCENT, REX. Pulp and paper market review—1953. Can. Pulp Paper Ind. 7, no. 4: 76, 78, 80 (April, 1954).

The American per capita consumption in 1953 amounted to nearly 400 pounds of paper and paperboard. The author emphasizes the fact (which is often not clearly understood in all quarters) that from time to time the industry must run at overcapacity to be able to meet the requirements later on. Inventory liquidation of over 300,000 tons of market pulp during 1953, in addition to the consumption of 1,661,000 tons produced in the United States during this period, shows the year to be a very good one for the consumption of this type of pulp, even if production was 2% less than in 1952. The dissolving grades of wood pulp have so far failed to live up to the expanding uses predicted several years ago. The available increased capacity in 1953 was not fully utilized; three new mills are expected to be in production by June, 1954. However, from a world point of view, there is no overexpansion of pulp production, either paper or dissolving pulp, but a way must be found to remove existing barriers to foreign trade, notably the dollar problem. Otherwise one part of the world will drown in cellulosic raw material, while other parts will suffer from the lack of it. 5 tables and 1 figure. E.S.

VOGEL, JOHN H. 1954—a year of transition. Paper & Twine J. 28, no. 1: 18-20 (March, 1954); *cf.* B.I.P.C. 24: 213-14.

Essentially the same information on the outlook of the pulp and paper industry for 1954 is presented as in the preceding reference. R.A.S.

PAPER AND PULP INDUSTRY—EDUCATION

GUILLON, —, and JOUET, G. News from the technical papermaking schools at Grenoble. Rev. papiers et cartons 17, no. 7: 16-17 (April 1, 1954). [In French]

The two-year courses at the Ecole Vaucanson for training supervisory personnel for the French paper industry are described. The courses include a two-weeks' term in different co-operating mills; regular and special students (mill personnel sent by their companies) are admitted. On successful completion of the final (practical, written, and oral) examinations, the students receive the diploma of "papermaking technician." E.S.

PAPER AND PULP INDUSTRY—TRADE CUSTOMS

CROCKER, DOUGLAS A. Problems of short count in tissues thing of past. Paper & Paper Products 95, no. 19: 2, 23 (April 5, 1954); *cf.* B.I.P.C. 24: 637.

The problem of the competition of dishonest merchandise in the tissue industry and the method of eliminating it before considerable loss can occur are considered. Weights and measures officials exist on state, county, city, and other local levels under the sponsorship of the National Bureau of Standards and can enforce the recommendation that each product be labeled with the number of sheets and tissues and sheet sizes equally prominent. 1 table. R.A.S.

PAPER AND PULP MILLS

ANON. Two new mills at East Millinocket plant. Paper Trade J. 138, no. 15: 16-18 (April 9, 1954); *cf.* B.I.P.C. 21: 102.

The current expansion of Great Northern Paper Co.'s plant at East Millinocket, Me. is expected to triple its production of newsprint. The program includes construction of a new concrete wood-room building, a steel and brick grinder room, a plant for pretreatment of hardwood, and a machine-room building in which will be installed two new Beloit paper machines; rebuilding of the old wood room into a water-filtration plant and of the low-pressure into a high-pressure steam plant; and remodeling and installation of new equipment for the screen room. 4 illustrations. R.A.S.

CRAIG, F. A. Paper mills in Britain; their location and a brief survey of their products. Paper and Print 27, no. 1: 83, 85, 87 (Spring, 1954).

The location, size and set-up, and types of mills (including rag, esparto, wood-free, white and color, news, wrapper, M.G., board, and specialty mills) in England and Scotland are discussed. 2 maps. R.A.S.

THIMOTHEE, ROSELINE. A visit to the Papeteries Lauriat at La Garenne Colombes. Papetier 8, no. 3: 56-7 (March, 1954). [In French]

A participant in a student visit to a French handmade-paper mill describes the different operations involved in making the sheets. 3 illustrations. E.S.

PAPER BREAKS

ANON. Effect of humidity on newsprint; web breaks and printing quality. Am. Newspaper Publ. Assoc., Research Bull. no. 80: 1-2 (Jan. 6, 1954).

A brief reference is made to a series of experiments on the effects of R.H. on newsprint breaks during printing. Web breaks/100 rolls dropped from 2.3 at 20% R.H. to 1.2 at 80%; the sharpest drop occurred around 50%. Many other variables were investigated, including paper-handling techniques and manufacturing conditions; none showed the same marked relationship. The number of breaks from rolls which had been stored for a time is higher than from those received directly from the mill; the drying which takes place during storage accounts for this fact. For the majority of newsprint no attempt should be made to maintain R.H.'s above 50% or some loss of printing qualities will be suffered. Many samples tested underwent severe changes even below 50% R.H. Beyond that point ink-penetration rate is slowed, transparency, bulk, and basis weight increase, and smoothness declines. E.S.

PAPER FINISH

PETERSON, V. The finish (gloss) of machine-glazed paper. II. The influence of the constituents in the furnish on gloss. Svensk Papperstidn. 57 no. 6: 191-3 (March 31, 1954). [In Swedish; English and German summaries] *cf.* B.I.P.C. 24: 297-8.

In a continuation of the study of the gloss (I) of M.G. paper, the following factors were varied: the amount of rosin size, clay, and starch in the furnish, its pH, and the quality of the pulp (determined by the ratio of the percentages of lignin and hemicelluloses present). (I) was found to be independent of the amount of rosin size and was affected by the pH only in the case of sized papers. In certain cases (I) was improved by the addition of small amounts of starch and clay in the furnish. (I) was found to increase with decreasing ratios of hemicellulose to lignin. Although the seven paper samples employed in the last experimental series were not especially prepared for this purpose—so that other factors may have exerted an influence on (I)—the author does not believe that this happened to such an extent that the effect of the hemicellulose-lignin ratio should be considered purely accidental. 4 tables, 3 figures, and 1 reference. E.S.

PAPER SIZING

BERKMAN, E. M., and FLYATE, D. M. The rosin sizing of paper. Bumazh. Prom. 28, no. 6: 9-14 (June, 1953). [In Russian]

For abstract *cf.* C.A. 47, no. 19: 10225 (Oct. 10, 1953). 13 references. E.S.

ILER, R. K. Stearato chromic chloride. Ind. Eng. Chem. 46, no. 4: 766-9 (April, 1954); *cf.* B.I.P.C. 23: 902.

Following the discovery that paper could be rendered water repellent by treatment with chromyl chloride vapor, the reaction products of chromyl chloride with certain organic materials were investigated with the objective of finding a hydrophobing agent that could be applied from aqueous solution. This led to the development of stearato chromic chloride (Quilon), a complex compound in which stearic acid is combined with basic trivalent chromic cations to form a water-soluble, surface-active product which is strongly adsorbed from aqueous solution by negatively charged surfaces, such as cellulose, proteins, and glass. The adsorbed film is hydrophobic, and when

dried, the complex becomes insoluble in water. In the monomolecular adsorbed layer, each stearate group covers an area of 33 sq. A. The insolubilization of the complex appears to be due to hydrolysis of the chloride and polymerization of the resulting basic chromic cations. Stearato chromic chloride is currently being employed as a hydrophobing agent for paper, felt, and glass-fiber products, and as an antisticking agent where adhesion to surfaces is to be avoided. 4 tables, 1 illustration, and 9 references. E.S.

PAPER SPECIALTIES

ALLEY, HAROLD R. Mid-West launches new converted paper products. Paper Ind. 36, no. 1 : 51 (April, 1954).

The facilities and products of the Mid-West Wax Paper Co., including specialty papers, baking-industry papers, and household papers, are described briefly. The bulk of the products is made with special waxes. New developments include antifungus and pyrenone-treated papers, polyethylene-wax coated overwrap and locker papers, laminated locker paper, baking paper for high temperatures, corrosion-resistant saturated and vapor-phase-inhibitor papers, and wet- and dry-waxed metal innerleaver papers for the metal industry. E.S.

ANON. Focus on 1954 fancy papers. Paper Box Bag Maker: 118-22, 124, 126 (March, 1954).

Fancy papers in the 1954 styles and patterns offer variety in design, color, background, motif, embossings, and forms of pattern presentation. An increase in signature papers is becoming evident; metal and metallic, printed viscose, colored surfaces and enamels, and leather papers are particularly described. 13 illustrations. R.A.S.

ANON. New silicone treated papers. Paper Ind. 36, no. 1: 57 (April, 1954).

Reference is made to the organic silicone DC-1107 manufactured by Dow Chemical Co. and its application to various types of release papers used in the rubber, steel, candy, and container industries. The silicone-treated papers are nontoxic and also possess a certain amount of water repellency; the coating makes them resistant to heat well above the decomposition temperature of the paper. Special adhesives had to be developed to permit adhesion between silicone and other surfaces. E.S.

ANON. Wallpaper, an art and an industry. Papier, carton et cellulose 3, no. 1: 40-4 (March-April, 1954). [In French]

Following a brief historical introduction, the two classical methods for printing wallpaper from wood blocks and by rotary machines and different types of wallpaper (embossed, with plastic relief decorations, washable, and flock) are described. In conclusion, the building up of the designs on wood rollers by means of copper shapes filled in with felt is described in some detail; intricate designs may require as many as 300 hours for the preparation of a single cylinder. The use of copper rollers in which the pattern is engraved is also mentioned. 22 figures. E.S.

ARNOLD, JOHN. Current trends in box coverings. Paper Making 72, no. 4: 6-7, 9-10 (Winter, 1953/54).

Box coverings in the various fields of usage show the influence of the product itself and consumer appeal and preference on the choice of material and design. Among the varieties in popular demand are pastel shadings, mica embossed, signature-designed, high class flock papers, restrained decorative

and floral designed fancies, more sophisticated seasonal and special occasion, coated and printed, embossed fancy, and fabric and grained box coverings. 6 samples. R.A.S.

BERNOT, ANDRÉ. The technique and realization of the paper milk bottle. Papier, carton et cellulose 3, no. 1: 57-60 (March-April, 1954). [In French]

The advantages of paper milk bottles are outlined, and possible objections of French consumers are listed. The seven different types of paper milk bottles manufactured in different countries are described, including three American (Pure Pak, Sealright, and American Can), two German (Perga in two different constructions), one British (Satona), and one Swedish (Tetra Pak). 8 illustrations. E.S.

PAPYRUS

WISE, LOUIS E., and EL-TARABOULSI, MOHAMMED A. The rind and pith of "papyrus"—an analytical study. Tappi 37, no. 1: 25-8; correction: no. 4: 142 (January, April, 1954).

An orienting study was undertaken to provide chemical data, principally a summative analysis of both the rind and pith of Egyptian papyrus, the ancient papermaking material. Through an unfortunate error in botanical classification, the material studied was actually *Typha angustifolia;* the analytical data given in the article refer therefore to *Typha* and not to papyrus. 10 tables and 35 references. E.S.

PATENTS

THE INSTITUTE OF PAPER CHEMISTRY. United States patents on papermaking, fourth quarter, 1953. Tappi 37, no. 4: 212-19A (April, 1954); *cf.* B.I.P.C. 24: 566.

An annotated list of U. S. patents on papermaking for the fourth quarter of 1953 is presented. R.A.S.

PHYSICAL TESTING—PAPER—EXPANSION AND CONTRACTION

ARNAMO, A. Dimensional stability of paper and humidity. Intern. Bull. for the Printing and Allied Trades no. 67: 38-41; discussion: 41-2 (January, 1954).

Following a discussion of the factors which influence the dimensional stability of paper, an instrument for measuring this property at varying R.H.'s constructed at the Swedish Graphic Arts Research Laboratory is described. It permits the simultaneous testing of several samples; four strips in both machine and cross-machine directions were found the optimum number. The instrument has been used for routine testing for a long time at the laboratory and has been found very reliable. 2 tables, 4 figures, and 1 reference. E.S.

PHYSICAL TESTING—PAPER—GLOSS

HARRISON, V. G. W., and POULTER, S. R. C. Gloss measurement of high-gloss papers. Research 7, no. 4: 128-36 (April, 1954); *cf.* B.I.P.C. 21: 866.

A physical and psychological study was made of the gloss of a series of high-gloss, machine-glazed papers which differed widely in color. Much dis-

agreement was found between different observers, and marked changes in ranking occurred when the viewing conditions were changed. Gloss is considered a psychological quantity and, consequently, it is not possible to establish a gloss scale which will be satisfactory to all observers under all conditions of viewing. However, an empirical formula was constructed and tested which relates instrument measurements to the average judgment of gloss of many observers who view the paper under diffuse or single-lamp illumination such that recognizable mirror images are not formed. 14 tables, 6 figures, and 7 references. A.L.L.

PHYSICAL TESTING—PAPER—MACHINE DIRECTION

ANON. Paper grain. Paper Making 72, no. 4: 16-17 (Winter, 1953/54).

The importance of paper grain in bookwork is stressed; several simple methods of testing for machine direction are given. R.A.S.

PHYSICAL TESTING—PAPER—PRINTABILITY

BENDTSEN, C. The problem of measuring the uniformity of newsprint quality by electronic methods. Intern. Bull. for the Printing and Allied Trades no. 67: 54; discussion: 55 (January, 1954). [Abridgment]

A multitester suitable as a production control instrument calibrated to the individual properties of a particular paper is described. The substance and caliper thickness are measured for a strip of paper which is run through the machine; the substance variations are obtained by photometrical measurement of the opacity. The caliper is measured through a loaded needle and the variations are transferred in electro-magnetic variations which are registered on the recorder strip. From the substance and caliper, the moisture content, porosity, and smoothness are calculated according to derived empirical formulas. E.S.

OLSSON, I., and PIHL, L. Penetration of ink into paper. Intern. Bull. for the Printing and Allied Trades no. 67: 19-23; discussion: 23-4 (January, 1954).

The penetration of a liquid into a sheet of paper is discussed in accordance with the law of Hagen-Poiseuille. Different methods of testing the quantities in this law are analyzed; the influence of paper sizing and surface treatment of paper on oil penetration and the absorptive properties of paper in relation to printing speed are shown in experiments. Setoff and print-through (strike-through and show-through) in relation to paper are discussed. 4 tables, 3 figures, and 8 references. E.S.

OLSSON, I., and PIHL, L. The physical relationship between paper and ink. Intern. Bull. for the Printing and Allied Trades no. 67: 11-15; discussion: 15-16 (January, 1954); *cf.* B.I.P.C. 22: 763, 847; 23: 661.

Some of the results of studies at the Swedish Graphic Arts Research Laboratory, Stockholm, are summarized, in which the influence of different variables (printing pressure, viscosity of ink, printing speed, roughness of cylinder surface and cylinder diameter, mechanical conditions in the printing press, etc.) on ink transfer were investigated. 4 tables, 6 figures, and 4 references. E.S.

OLSSON, I., and PIHL, L. Testing the printability of newsprint. Intern. Bull. for the Printing and Allied Trades no. 67: 48-52; discussion: 52-3 (January, 1954); *cf.* B.I.P.C. 22: 847-8.

The physical properties of different kinds of newsprint were measured, including smoothness, porosity, oil flotation number, basis weight, opacity, etc. At the same time different factors connected with the printing result (ink-transfer number, blackness, print-through, etc.) were determined. The quality of the prints was judged by several observers and, through calculation of the correlation coefficients, the existing relationships between the quality of the print and the properties of the paper were investigated and discussed. The results seem to indicate that among the properties investigated, only porosity, ink receptivity, and opacity of the paper influence the printing result. 6 tables, 4 figures, and 5 references. E.S.

POULTER, S. R. C. A review of printability work. Intern. Bull. for the Printing and Allied Trades no. 67: 6-10 (January, 1954).

A review is presented which covers the means of forecasting printability and the task of objectively assessing the quality of a print under the headings: physical tests, work with proofing press, simplified printing methods, special "printing" apparatus for printability testing, and print quality. 70 references. E.S.

STEENBERG, BÖRJE. Influence of strength and mechanical properties on printability. Intern. Bull. for the Printing and Allied Trades no. 67: 35-7; discussion: 37-8 (January, 1954).

To understand the behavior of paper in the printing press, it is essential to know the complete stress-strain relationships; the classical paper-testing figures do not give information regarding the extent of deformations to which the paper is subjected in a press. The author reviews the present state of knowledge of the visco-elastic properties of paper and the extent to which they can be measured; apparently no instrument is yet on the market which will analyze the properties of ordinary printing papers under compression in a way similar to that occurring in a printing press. The importance of the visco-elastic properties of paper to the printer is illustrated with reference to problems of cockling and dimensional instability, and the need for further knowledge is emphasized. The need for additional information on the surface-strength properties of paper is also stressed, and the dusting problem in the printing industry is used as an example. E.S.

TOLLENAAR, D. Porosity in relation to printability tests. Intern. Bull. for the Printing and Allied Trades no. 67: 16-18 (January, 1954).

The author reviews briefly some of the theories of liquid penetration into porous media. 5 diagrams. G.R.S.

PHYSICAL TESTING—PAPER—SMOOTHNESS

ANDERSEN, E. E., and CHRISTENSEN, C. W. Measuring the smoothness and the surface hardness of paper. Intern. Bull. for the Printing and Allied Trades no. 67: 24-9; discussion: 30 (January, 1954).

The principles of several methods for determining smoothness of paper (Bekk, Gurley, Williams, Chapman, and Bendtsen) are described, with

particular emphasis on the Bendtsen smoothness tester (*cf.* B.I.P.C. 9: 456, translated in Pulp Paper Mag. Can. 41: 20-6, 43, 232-4, 291 [1940]). A direct conversion from one method to another is not feasible; an agreement between graphic arts research laboratories and paper manufacturers to standardize on the use of one method is therefore recommended. Paper hardness depends on at least four physical properties (compressibility or resilience, rigidity, surface structure, and density). The methods adopted for determining the hardness of the paper will measure these various properties, which to some extent are interrelated and not easily measured individually; any of the properties listed may be predominant in the results. As far as paper hardness for printability is concerned, surface hardness or compressibility and surface structure are of greatest importance. Of the different testers described (Bendtsen, Bekk, Gurley-Hill, and Clark), a modification of the Bendtsen smoothness test in combination with actual smoothness data is claimed to give results which correspond to actual printing performance. For instance, the Bendtsen tester will differentiate between the top and wire side of a paper, it will give a fine differentiation between calendered and uncalendered, wood-containing and wood-free, and sized and unsized papers. 12 figures and 14 references. E.S.

CHAPMAN, S. M. The Chapman printing smoothness tester. Part I. Basic development and recent modifications. Pulp Paper Mag. Can. 55, no. 4: 88-93, 104 (March, 1954).

The importance of smoothness as a printing property of paper has long been recognized. Depressions in the surface of the paper may fail to touch the ink film on the printing surface, and the resulting lack of ink transfer leads to white areas in the print. A measure of the amount of contact with a smooth surface would therefore seem to be a desirable method of measuring smoothness from the standpoint of its effect on printing. During printing, paper is subjected to considerable pressure which, on account of the compressibility of the paper, leads to increased smoothness. Since it is difficult to correct for this compressibility effect, it would appear to be desirable to measure the smoothness under pressures comparable to printing pressures. Printing smoothness is therefore defined as the fraction of the surface which can be brought into contact with a smooth surface pressed against it under pressures comparable to printing pressures. An instrument designed to measure this property by an optical method was disclosed in a previous report from the Pulp and Paper Research Institute of Canada (*cf.* B.I.P.C. 17: 512). The present paper reviews the theory of the method and discusses its theoretical shortcomings. One of these is the fact that the paper surface must make optical contact with a glass surface in order to register as contact. In printing, on the other hand, the paper surface need only approach the printing form to within the thickness of the ink film. This fairly fluid film can move about under the printing pressure and flow into very small depressions in the surface. Some experiments were carried out in which attempts were made to simulate this action of the ink film in printing. Recent modifications to the original instrument are also described. These improvements have resulted in making it direct reading and more readily standardized. 1 table, 6 figures, and 13 references. E.S.

OBENSHAIN, D. NOEL. The Chapman printing smoothness tester. Part III. Design and use of a direct reading tester. Pulp Paper Mag. Can. 55, no. 4: 105-16 (March, 1954).

The author covers the design, construction, and use of direct reading Chapman printing smoothness testers built by the West Virginia Pulp and Paper Co. at its Luke, Md. research laboratory. Five of the instruments have been

built to date for use in the company's laboratories. Considerable work has been done with the original tester. The instrument is a rugged, compact, self-contained unit which automatically indicates on an easily read dial the Chapman *F*-value of the sample of paper clamped therein. All controls are conveniently arranged for ease of operation. Special design features make the instrument substantially immune to damage by accidental misuse. Data presented on operation of the tester show very good correlation with printability. Included are some photographs of typical paper surfaces as viewed through the Chapman tester and the same papers as viewed through a low-powered microscope with the surfaces illuminated at a very flat angle. The calculations for a typical dial calibration and a complete list of parts for the instrument are given in the appendix. 6 tables, 26 figures, and 2 references. E.S.

SEARS, G. R., VAN DEN AKKER, J. A., APRISON, M. H., BECKMAN, N. J., and DENZER, C. W. The Chapman printing smoothness tester. Part II. Instrument variables and some results of application. Pulp Paper Mag. Can. 55, no. 4: 94-104 (March, 1954); *cf.* B.I.P.C. 22: 273-4; 24: 387-8.

A printing smoothness tester, having an optical system which is a modification of Chapman's original arrangement, is described. The linearity of the photometric systems was found to be satisfactory. The *A'* reading for zero optical contact during the calibration procedure is ascribed to stray light originating principally at debris and surface imperfections on the bottom face of the prism. The instrument constants and the *F*-values of paper were found to be essentially independent of the voltage applied to the lamp as long as the voltage was steady during calibration and determination of each *F*-value. The use of mineral oil instead of a liquid having a refractive index more nearly matching the index of the glass prism was found to introduce an error in *F*-values of only 1 or 2%. It is shown that no serious error in relative smoothness values should result from the variability in color of "white" papers. In comparisons of highly colored papers, a red sheet would have a higher smoothness value than a green or blue sheet. The combined variabilities of papers and the instrument are as small as can be expected on the basis of the known variability of paper. The *F*-values of papers increase with increasing time of pressure application in the instrument. The minimum time of pressure application in the present instrument is large compared with impression times in printing. The nature of the material with which a specimen is backed when in the tester influences the observed smoothness value; softer backing leads to higher smoothness. The change in smoothness with change in backing material varies among papers. The patterns of contact areas vary greatly among papers, and it is noted that visual observations of the patterns as well as determinations of *F*-values are important in the comparison of papers. Particularly in the case of gravure prints there is correlation between skips in the print and noncontact areas when under pressure in the Chapman instrument. The smoothness values of a number of rubber sheets and offset press blankets were found to differ considerably at low pressures. 9 tables, 18 figures, and 3 references. E.S.

PHYSICAL TESTING—PULP—BEATER PROCESSING

KENWORTHY, J. W. The beating of chemical pulp in a laboratory beater. Norsk Skogind. 8, no. 3: 103-5 (March, 1954). [In Norwegian; English summary]

The standard Jokro laboratory beater and experiments carried out with sulfite pulp in a modified type of Jokro beater are described. The change

consisted in the removal of the grooves on the standard beater roll so that the pulp was beaten between quite smooth surfaces. The strength properties of sheets from pulp treated in the modified beater varied only slightly from those of pulps beaten in the standard type. The grooves on the beater roll therefore seem to be of less importance than has been previously assumed. 1 table and 8 figures. E.S.

PHYSICAL TESTING—WAX

YATES, W. J. TAPPI-ASTM Technical Committee on Petroleum Wax. Tappi 37, no. 4: 153-6A (April, 1954); *cf.* B.I.P.C. 24: 389.

Brief reports by the chairmen of the different sections of the committee are given as follows: Padgett, J. W. Strength tests, p. 154A; Phillips, Joseph, and Turner, W. R. Flow tests, p. 154A; Hinds, G. P., Jr. Oxidation, p. 154-5A; Fronmuller, G. D. Sensory tests, p. 155A; Rather, J. B., Jr., and Koppenhoefer, R. M. Composition, p. 155A; Hitchcox, Harold F. Wax blocking point, p. 155A; Borden, G. C., Jr., and Van Esselstyn, S. T. Sealing and laminating, p. 155-6A; and Mueller, George P. Gloss and scuff, p. 156A. E.S.

PLASTIC FILMS (NONCELLULOSIC)

DULMAGE, F. C., JR. Saran film today. Modern Packaging 27, no. 8: 117-21 (April, 1954).

Following a brief review of the history of the development of saran film, the chemical and physical structure, properties and uses, sealing methods, types of film, and potentialities are summarized. 3 tables, 11 figures, and 11 references. R.A.S.

POWER

ANON. Power and heat equipment for the paper industry. Can. Pulp Paper Ind. 7, no. 4: 36-8, 130 (April, 1954); *cf.* B.I.P.C. 24: 228.

Several alternatives for securing optimum thermal economy in steam plants of pulp and paper mills, including the correct combination of electric boilers, accumulators, and fuel-fired boilers, with particular reference to installations by Sulzer Brothers, are described. 4 diagrams. E.S.

PRINTING AND PRINTER'S INK

BRAUNS, OTTO. What can the paper maker do to improve the printability of paper? Intern. Bull. for the Printing and Allied Trades no. 67: 55-9; discussion: 59 (January, 1954).

The author discusses some of the variables over which the papermaker has control (selection and preparation of pulp, paper-machine operation including sheet formation and drying, and calendering) and the extent (and limitations) to which he can influence the resulting product. Since the Stockholm Printing Conference (at which the paper was presented) demonstrated that much more knowledge must be accumulated by the printers before they will be in a position to suggest definite changes in the manufacture of paper, the papermaker can hardly be expected to know so much more of printing that he should be able to produce the correct paper for the printer. Recent work on stress-strain properties of paper has shown that more attention should be given to such questions in the design of new paper machines. The need for

accumulating more knowledge with regard to printing and papermaking is clearly indicated, particularly the development of methods for measuring certain important properties. 9 diagrams and 1 reference. E.S.

CARLSSON, GÖSTA E. The printability of paper. (Introduction). Intern. Bull. for the Printing and Allied Trades no. 67: 4-6; discussion: 6 (January, 1954).

Printability (I) of paper was selected as the subject for discussion at the Second International Conference held in Stockholm, Sweden on June 8-13, 1953. As an introduction to the discussion, the author attempts to give a definition of the term, showing that it comprises all the properties of the paper in the printing machine and the qualitative and quantitative printing result, in other words, (I) stands for the suitability of paper as a raw material for the printing process. It is therefore impossible to establish any general standards or demands for the (I) of paper; the demands have to be changed according to the printing conditions. E.S.

DELLER, JACK, BUSH, C. F., and MCGANLEY, J. W. Cover stocks need not be pressmen's problem children. Parts 1-3. Paper and Print 27, no. 1: 25-7, 29-31, 95 (Spring, 1954).

Each of the authors covers problems involved with a different type of printing process in the printing of cover stocks. The first author discusses the selection of ink; press make-ready; design, blocks, and type; green pony skin finished stock; and rubber printing plates in connection with letterpress printing. The second author analyzes silk-screen printing, particularly its application to delicate work and out-of-contact and air printing. Die stamping is discussed by the final author, including suitable cover stocks, the counterpart, grain removal, ink additives, water inks, the stamping of and water colors on soft materials, and light colors on dark stocks. 7 illustrations. R.A.S.

NACE, DONALD M., and WALKER, WILLIAM C. Loss of drying on aging; properties of hydrate lakes. Ind. Eng. Chem. 46, no. 4: 769-73 (April, 1954).

Loss of drying on aging has been a serious problem in the paint and printing-ink industries for many years. The present study was undertaken to learn the nature of this difficulty and means of avoiding it. Alumina hydrate lakes were studied as a group, since a poll of the printing-ink industry showed them to be the most serious offenders. Studies of loss of drying on aging of printing inks containing alumina hydrate lake pigments have shown that the loss increases with increasing acidity and moisture content of the pigments. It is also severe in the presence of Turkey-red oil and lakes containing excessive dye. The experimental data indicate that this loss is due to the adsorption of the cobalt onto the pigments. Two adsorption mechanisms are suggested for different lake pigments: One involves reaction of the cobalt into the acidic water film surrounding the pigment particles and the other involves the reaction of the cobalt with oil-soluble organic sulfonic acids where these are present. A cobalt adsorption test has been developed to distinguish those alumina hydrate lakes which are likely to produce loss of drying on aging. These pigments can either be avoided or corrective agents can be used. 6 tables, 5 diagrams, and 13 references. E.S.

NEWCOMB, ROBERT K. Lithography and the papermaker. Tappi 37, no. 4: 159-61A (April, 1954).

The sheet-offset process and troubles caused by the paper, dimensional

instability in particular, are discussed. The possibilities of web-offset printing are pointed out; it is four times as fast as sheet-fed work, and a much wider variety of paper can be used—from newspapers through business forms and labels and checks to the finest type of multicolor printing. E.S.

THOMA, PAUL J. [Letterpress printing research] Tappi 37, no. 4: 171-3A (April, 1954).

The author outlines some phases of the research program of Time, Inc. at the Springdale, Mass. laboratories directed at improving letterpress-printing operations to obtain reduced cost, improved quality, and better delivery schedules. Developments in printing machinery and efforts for making the use of lower basis-weight paper possible are described, including new printing plates and packing, the elimination of shock loads placed upon the paper in the printing machines by the use of vacuum rolls ahead of the printing units, lower drying temperatures, the use of calcium silicate in the raw stock to maintain brightness and substitution of bleached with unbleached groundwood to improve opacity, the use of rolls with a larger diameter and eight-inch cores, possible changes in the type of pulp required, etc. E.S.

PULP AND PAPER—IMPURITIES

COUPE, R. R. The influence of chemical residues in paper on printability. Intern. Bull. for the Printing and Allied Trades no. 67: 42-7; discussion: 47-8 (January, 1954).

Three types of harmful effects of chemical residues in paper (I) are discussed. (I) may cause discoloration of inks or tarnishing of bronze printings; examples from the literature are given. (I) may also result in unsatisfactory drying of the ink. Some recent work by PATRA is discussed which showed that the nondrying on acid papers is associated with the prevailing R.H., hence is more noticeable in lithography than in letterpress. In two sets of bleached sulfite sheets (to the pulp of which different amounts of either dilute sulfuric acid or alum were added), the drying time of ink was found to be a function of the cobalt adsorption of the paper; the effect was less noticeable in those treated with alum. (I) may also cause sensitization of lithographic plates; alum extracted by the damping waters from papers during printing is one of the causes of scumming (*cf.* B.I.P.C. 9: 36-7). It is recommended that the hot extract pH of paper should not fall below 4.8 or 5. 3 tables, 5 figures, and 13 references. E.S.

PULP WASHING

ORR, WILBUR L. Effect of digester and liquor room operation on pulp washing. Tappi 37, no. 4: 162-3 (April, 1954).

The effect of various changes in the digester room (the use of pulp of a lower permanganate number, different methods of charging the digester, separate cooking of rejects, and avoidance of complete exhaustion of the active chemical in the digester) and liquor room (evaporators of sufficient capacity and clean liquor free from mud) on the efficiency of pulp washing are discussed. It is shown that the capacity of the washroom can be materially increased by close control of the other departments of the pulp mill. E.S.

WEST, P. H., COLLINS, T. T., JR., and BERGSTROM, R. E. Sulphate pulp washing at Thilmany. Tappi 37, no. 4: 137-42 (April, 1954).

The selection of the new brown stock pulp washing system at the Thilmany Pulp and Paper Co., Kaukauna, Wis. resulted from an extensive investigation of various systems in southern mills and modern diffusers in Sweden. Rotary vacuum pulp washing and auxiliary equipment was purchased after consideration of such factors as labor costs, the need for a low chemical content in the washed pulp, and low dilution of the blow liquor. It was also necessary to have sufficient high-density storage capacity to obtain the flexibility required for a specialty mill and yet utilize but one line of washers. The decision to purchase a Swenson pulp-washing system was arrived at after actual operating data on their systems confirmed their performance statements. This was supplemented by the fact the Swenson would guarantee performance. The early operation disclosed the need for extremely well-washed pulp and the desirability of studying operating variables. The elimination of the soap problem in the first-stage filtrate tank, the changes in vat consistencies, repulper design, and arrangement of shower nozzles contributed to a reduction in chemical losses. Continued improvements in operation resulted in obtaining better than the guaranteed performance. Additional tests conducted at a lower permanganate range resulted in total salt cake losses of less than 10 lb./airdry ton of pulp with dilution factors under 1.5. A survey of various procedures for determination of salt cake content in the washed pulp is listed in the bibliography. 2 tables, 4 illustrations, and 5 references. E.S.

RADIO

SANDGREN, HANS. Direction of transports by means of radio in woods operations. Norsk Skogind. 8, no. 3: 91-3 (March, 1954). [In Swedish; English summary]

The system of radio communication between the wood-trucking units and the kraft mill of Korsnäs Aktiebolag, Gävle, Sweden and its advantages are outlined. E.S.

RAW MATERIALS

MITRA, D. N. Pulp and paper from agricultural residues. Indian Pulp and Paper 8, no. 7: 344-9 (January, 1954).

The possibilities of agricultural residues (notably cereal straws and bagasse) for pulp and papermaking, the characteristics of these raw materials, suitable pulping processes, and new plants utilizing them in different parts of the world are reviewed. 2 illustrations. E.S.

RAW MATERIALS—NON-FIBROUS

POOR, E. N. TAPPI nonfibrous raw materials report for 1953. Tappi 37, no. 4: 14A, 16A, 18A, 20A (April, 1954); *cf.* B.I.P.C. 23: 666.

Information on the availability, new uses, price changes, substitutes, and outlook for 1954 is presented for the following chemicals and nonfibrous raw materials used in the pulp and paper industry: sulfur, lime, caustic soda, sodium aluminate, soda ash, sulfur dioxide, chlorine, rosin, casein, alum, zinc sulfide pigments, clay, titanium pigments, glue, peroxides, starch, dyes, enzymes, wet-strength resins, synthetic resins, and wax sizes. R.A.S.

RESEARCH

ANON. How a research foundation works. Can. Chem. Processing 38, no. 2: 78-80 (February, 1954).

The advantages of sponsored fellowships in the Ontario Research Foundation are illustrated by describing an actual case history, the fellowship sponsored by Dominion Cellulose Co. of Weston, Ont. Typical investigations involved the determination of the most suitable blend of pulps to use to obtain a facial tissue of the highest degree of softness, strength, and freedom from dust at minimum cost; the determination of a proteolytic organism present in the fresh-water supply which caused the rapid deterioration of felts and the incorporation of a chemical in the felts to provide protection; the addition of a polyphosphate to the mill system to prevent pitch troubles on the drying cylinder of the machine; and the impregnation of sulfur-free tissue paper for wrapping silverware with a compound which reacts with the sulfur gases in the air (trade name Tarno). 5 illustrations. E.S.

RESEARCH LABORATORIES

BETHEL, JAMES S. The North Carolina Wood Products Laboratory. J. Forest Products Research Soc. 4, no. 2: 81-4 (April, 1954).

The operation of the laboratory, including basic processes and manufacturing methods, and the research program are explained, with emphasis on the way in which co-operation is carried out with industry. 1 table and 2 figures. R.A.S.

ROSIN

STINSON, J. S., and LAWRENCE, RAY V. Thermal isomerization of gum rosin. Ind. Eng. Chem. 46, no. 4: 784-7 (April, 1954).

Practically all gum rosin is processed at temperatures between 155 and 290°C. by both the original oleoresin distiller and the final derivative manufacturer. This study was undertaken to determine the changes taking place in this temperature range. These changes fall into two categories: Moderate heating for short periods of time brings about an increase in softening point, a more negative optical rotation, a slight decrease in acid number, and an increase in its tendency to crystallize; higher temperatures or prolonged heating at moderate temperatures cause an opposite trend in most of these changes—i.e., a decrease in softening point, a more positive optical rotation, a greater decrease in acid number, a decrease in the tendency to crystallize, and an improvement in color grade. The results of this study should permit a more accurate prediction of the changes likely to occur in processing at temperatures in the range covered. 3 tables, 5 diagrams, and 15 references. E.S.

SEMI-CHEMICAL PULPING PROCESS

MACLAURIN, D. J., and WHALEN, J. F. Continuous high-yield kraft pulping of Douglas-fir lumber waste. Tappi 37, no. 4: 143-7 (April, 1954).

A range of high-yield (60 to 70%) Douglas-fir kraft pulps were prepared in an apparatus simulating a commercial Chemipulper, from composites and fractions of hammermilled box ends, chipped slabwood, chipped tops and limbs, and chipped logs. The better pulps had handsheet crush and other strength properties about equal to those obtained from typical average corrugating medium pulps. In general, the yield decreased with increasing cooking chemical and pressure. Strengths increased with increasing chip size and decreasing yield. Black liquor solids calorific values ranged from 6500 to 7500 B.t.u./pound of solids. 6 tables, 8 figures, and 14 references. E.S.

SHIPPING CONTAINERS—MULTIWALL BAGS

ANON. Multiwall bags, their economic and technical progress. Papier, carton et cellulose 3, no. 1: 63-5 (March-April, 1954). [In French]

The different types of multiwall bags and their advantages are described; particular reference is made to the consumption of these bags in France, which reflects somewhat the general economic conditions in the country. About 85% of the French cement output is shipped in multiwall bags; their use for chemicals, human foodstuffs, and animal feeds is increasing. 2 tables and 6 illustrations. E.S.

SHIPPING CONTAINERS—TESTING

MCKAY, ROBERT L. Shock-mounting systems; experimental and mathematical methods of analysis of the responses of cushioning devices. Modern Packaging 27, no. 8: 122-5, 186, 188-9 (April, 1954).

Parameters which constitute the characteristic response of mounting systems are described using experimental methods of analysis. The term "mounting systems" is taken to include substances used as cushioning as well as systems where a definite positioning effect is provided. Where permissible, an analogous system and its study are included from the literature dealing with the methods of electrical engineering and servomechanisms. Generally these latter methods are cited by reference and only a very brief portion of the analogous system is applied in this paper to indicate its usefulness to packaging research. Repeated applications of the method for measuring viscous friction constant (damping) have shown that an accuracy to within 0.002 is possible. 1 table, 7 figures, and 5 references. E.S.

SLIME PREVENTION

COOK, H. G., and TURNER, J. N. Slime control with phenyl mercuric acetate. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 34, no. 3: 479-90; discussion: 491-6 (December, 1953).

The distribution of the mercurial in phenylmercuric acetate (I) throughout the system, particularly its absorption by the fiber, is discussed, and reasons for the effectiveness of the product are suggested. Two general methods are possible, continuous and shock dosage; the latter has been found to give more efficient and economical control than the former. When (I) is used for slime control, a proportion of the mercury is retained by the fiber, and the properties of the retained mercurial are different from those of (I). Laboratory experiments with different sized and unsized pulps indicated that in all cases, there is a comparatively high absorption of mercury; the degree of retention was lowest with bleached unsized fibers. In the presence of rosin and alum, the percentage retentions were all of the order of 50%; an exception was unbleached kraft (62%). With the exception of mechanical wood and waste paper of the Group 39, the addition of rosin and alum was found to increase mercury retention slightly in the case of unbleached pulps, and considerably in the case of bleached pulps. The mercury content of paper taken from machines on which (I) is used increases very rapidly to a maximum shortly after each addition of the agent and then decreases, reaching its former low value in four to six hours. The authors' results were in agreement with those of Lundgren (*cf.* B.I.P.C. 19: 880). It is suggested that the efficiency of (I) as a slime-control agent is partially due to its adsorption on the surfaces of chests, pipe lines, etc., as well as to the presence

of fine fibers containing relatively high concentrations of the mercurial in the white water. Details of the chemical and biological analytical methods are given in appendixes. 1 table, 1 figure, and 6 references. E.S.

TURNER, J. N. The biology of papermill slimes. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 34, no. 3: 475-8 (December, 1953).

Following a brief discussion of the micro-organisms causing slime in paper mills and the lack of fundamental research on the reasons for slime outbreaks, the author postulates that the study of the nutrients for slime bacteria may offer a promising line of approach to the problem. To build up in the way they do, large quantities of water-soluble nutrients must be available. The ways in which water-soluble carbohydrates vary in the different mills may provide the secret to the presence or absence of slimes. The hemicellulose content of pulpwood and the soluble sugars present vary greatly according to the type of wood, size of tree, and season at which the tree is felled. Cooking conditions of chemical wood pulps also influence considerably the hemicellulose or free sugar content. The presence of cellulose-splitting organisms is another factor which may affect the sugar available for the nutrition of the slime bacteria. If large numbers of cellulolytic bacteria are present in white water, their ability to hydrolyze insoluble celluloses into low-molecular weight sugars which can then be utilized by the slime-forming organisms may determine whether or not slimes will form in a mill. In conclusion, the author refers briefly to the question of acquired chemical resistance of slimes. With the wide variety of mill conditions, the author does not believe in the development of slime resistance to chemical treatments. The not infrequent reappearance of slimes in mills successfully protected by phenylmercuric acetate is considered to be rather a change of the microbiological population. If one slime-producing organism is attacked and weakened by chemical treatment, a competing slightly more resistant organism may take its place. The slime is said to have become resistant when it is actually a different sort of slime. 4 references. E.S.

SMALL ORDERS

SHAPIRO, IRVING. A successful plan for handling small orders. Am. Paper Merchant 51, no. 4: 29 (April, 1954).

The Mansfield Paper Co., Springfield, Mass. eliminated bookkeeping costs on small orders by requesting that payment on all orders under $10 be made to the delivery man. R.A.S.

SPECTROPHOTOMETRY

SCHURZ, JOSEF. The application of absorption spectrophotometry to problems of pulp chemistry. Das Papier 8, no. 5/6: 73-8 (March, 1954). [In German; English and French summaries]

Following a brief introduction of the fundamentals of the reciprocal action between light and matter, recently developed applications of ultraviolet spectrophotometry to pulp and viscose problems are reviewed. Investigations for the differentiation of β- and γ-celluloses, the detection of the photochemical cellulose degradation, and several analytical uses (determination of lignosulfonic acid in effluents, sulfide in black liquor, carbon disulfide and hydrogen sulfide in discharged air, etc.) are discussed briefly. In conclusion, reference is made to preliminary experiments for the measurement of the ultraviolet absorption of the spent liquor from the mercerizing process (yellow liquor) for pulp evaluation purposes and the possibilities of the method; additional

data are required before definite conclusions can be drawn. 4 figures and 27 references. E.S.

STARCH

ANSARD, M. The use of starch in papermaking. Papier, carton et cellulose 3, no. 1: 75-80 (March-April, 1954). [In French]

The physical and chemical properties of starch are described, and different types of modified starches (dextrins and acid-treated, oxidized, enzyme-treated, cold-swelling, and etherified starches) are discussed. Starch applications for beater, tub, or calender sizing, coating, and the manufacture of gummed and wallpaper are outlined briefly, although these do not cover the entire range of starch uses in the paper and board industries. 1 table, 3 figures, and 18 references. E.S.

STATISTICAL METHODS

THERIAULT, JOSEPH. Some introductory remarks pertaining to statistical quality control for paper mills. Tappi 37, no. 4: 161-3A (April, 1954).

The author stresses the importance of the establishment of some sort of quality levels by the manufacturer of today and describes methods of statistical quality control as it might apply to a paper or paperboard mill. Phases in the process of control outlined include test sampling, the determination of sample averages, the plotting of the curve of their distribution, the calculation of the standard deviation, the recording on data sheets, the graphing of the data on a simple graph to facilitate reading, and the decision if and what corrective measures are necessary. 1 diagram. R.A.S.

STEAM POWER

BÖRGER, H. E. A. Steam pressures and temperatures in modern paper mills. Indian Pulp and Paper 8, no. 7: 341-3 (January, 1954).

The use to which steam is put in a paper mill will determine the pressure and temperature, as well as the over-all plant economy. Boiler efficiency should be as high as possible, but not at the expense of a suitable pressure; the highest practical steam pressure and temperature should be selected and maintained. Appropriate modernizations of existing power services in India and intelligent planning of new installations could easily save 25% in power costs in the average establishment of the country. 1 table and 1 diagram. E.S.

STRAW—WASTE LIQUOR

FALDNER, JOSEF. The utilization of spent liquors from straw pulping. Wochbl. Papierfabrik. 82, no. 4: 111-13 (Feb. 28, 1954). [In German] *cf.* B.I.P.C. 22: 359.

The possibilities of utilizing spent monosulfite cooking liquors (I) from straw pulping for replenishing the depleted humus substances in arable land (into which the straw is consistently not being plowed back because of industrial utilization) are discussed. Reference is made to preliminary experiments with an Italian loamy soil very poor in humus which was used for pot culture of Italian summer wheat. A pretreated (I) mixed with this soil apparently hastened wheat germination and in no way interfered with growth, even when applied as a top dressing to plants grown in untreated soil. The

author admits the preliminary nature of these laboratory experiments from which no definite conclusions can be drawn. He recommends large-scale experiments. 3 tables. L.E.W.

STREAM POLLUTION

NATIONAL COUNCIL FOR STREAM IMPROVEMENT. Stream improvement. Tappi 37, no. 4: 106A, 108A, 110A, 112-16A (April, 1954); *cf.* B.I.P.C. 23: 670.

Excerpts from the annual report for 1953 are given in which the activities and developments during the past year in sulfite, kraft, semichemical, white water, deinking, and strawboard effluents, stream analysis, aquatic biology, and dehydration of hydrogels are reviewed. E.S.

ORLOB, GERALD T., and ELDRIDGE, E. F. Deep-water disposal of pulp mill wastes into Port Gardner Bay, Everett, Washington. Sewage and Ind. Wastes 26, no. 4: 520-30 (April, 1954); *cf.* B.I.P.C. 21: 805.

As a result of the formation of a pollutional barrier, consisting of an oxygen-deficient mass of water confined within the channel of the Snohomish River at its entrance into Port Gardner Bay, impeding the normal migration of salmon, two large sulfite mills situated at the river mouth co-operated in the construction of an underwater disposal line capable of dispersing 22 million gal./day of concentrated digester liquor and wash waters through a series of outlets over a 1000-foot section at a depth of 300 ft. in Port Gardner Bay. The pipeline is considered only a temporary solution, since both mills are seeking methods of eliminating or reducing waste by process conversions, such as changing from calcium to either an ammonia- or magnesium-pulping base. Samples taken in 1949 and in 1951 after the line was in operation were compared as to dissolved oxygen (I), spent sulfite-liquor concentration (II), and chloride content. In both cases, (I) was never recorded at less than 5 p.p.m. (II) was recorded as high as 650 p.p.m. in 1949 and reached a maximum of 76 p.p.m. in 1951. As a temporary means, the method is considered to have a number of significant advantages over the old method of surface discharge. 6 tables, 4 diagrams, 4 maps, and 1 reference. R.A.S.

SULFITE MILLS

ANON. Modernization program of Alaska Pine and Cellulose Limited. Pulp Paper Mag. Can. 55, no. 4: 72-9, 82 (March, 1954); *cf.* B.I.P.C. 24: 658.

The description of the expansion of the Port Alice mill of Alaska Pine & Cellulose Ltd. is essentially the same as that in the previous reference. 8 illustrations. R.A.S.

SULFUR

ANON. Purifying natural gas: sulphur a valuable by-product. Can. Chem. Processing 38, no. 3: 72, 74, 76, 78, 80, 87 (March, 1954).

The principles of the Girbotol process for purifying natural gas by the removal of hydrogen sulfide and of the oxidation of the recovered hydrogen sulfide to elemental sulfur in a modified Claus process recovery plant are outlined. 2 flowsheets and 2 illustrations. E.S.

UPKEEP PAINTING

HENDERSON, W. W. Technical mastics for paper mill corrosion control. Southern Pulp Paper Mfr. 17, no. 4: 34, 36, 38, 40 (April, 1954); *cf.* B.I.P.C. 22: 286.

Various grades of Erkote mastics (a mixture of synthetic rubber, synthetic resins, gilsonite and mid-continent asphalt, and inorganic fillers such as flake mica and asbestos) and appropriate applications for corrosion resistance and insulation in the pulp and paper industry, particularly in the South, are described. 6 illustrations. E.S.

VENTILATION

METCALFE, W. K. The application of air to the paper industry. Southern Pulp Paper Mfr. 17, no. 4: 58-60, 62, 64, 66, 68, 70, 72-4 (April, 1954).

The author stresses the importance of air in and around paper mills and the need for the correct use of this readily available yet rather expensive medium. Following a brief review of the fundamentals involved in an air system for any pulp, paper, or paperboard machine and mill, applications on machines (hoods, exhausts, applications to sheets and felts, etc.), in the machine room, the finishing room, in stock preparation, screen room, grinder room, bleach plant, brown-stock washing, digester room, turbine room, motor-control and generator rooms, and locker rooms, and special applications are discussed, with particular reference to conditions existing in the paper industry in the South. 20 illustrations. E.S.

VISCOSITY

KRÄSSIG, HANS, and MÜLLER, HELMUT. The relation between intrinsic viscosity and degree of polymerization of cellulose nitrates. Chem.-Ztg. 78, no. 7: 209-12 (April 5, 1954). [In German]

A critical review of recent investigations of acetone solutions of cellulose nitrate indicates that the Staudinger equation relating intrinsic viscosity and D.P. is, for practical purposes, valid in nearly every case. 12 tables and 22 references. K.W.,Jr.

WAXES

BEHNKE, J. M. Paraffin emulsions in the paper industry. Wochbl. Papierfabrik. 82, no. 2: 39-40 (Jan. 31, 1954). [In German]

The advantages resulting from either beater sizing or coating applications with paraffin emulsions in the paper, board, and converting industries in the United States are outlined. E.S.

WOOD

LEWIS, HARRY F. Problems affecting the wider use of wood as a technical raw material. Parts I-III. Paper Ind. 35, no. 10: 1115-17; no. 11: 1213-14 (January, February, 1954); 36, no. 1: 55-7 (April, 1954).

In the first part (The wood chemical industry) the author emphasizes that the national resources of each country determine the character of its wood utilization. Newer trends in wood distillation and saccharification and the hydrogenation of lignin and wood are discussed briefly. The need for more

fundamental research is stressed. In the second part (The wood pulping industry) the possibility of producing either high-yield pulps or chemicals from lignin, depending on various economic conditions, is discussed. Cellulose derivatives are mentioned briefly. In the third and final part (Hardboard production and bark utilization) the Masonite, Chapman, and Novoply processes for hardboard production, the utilization of various barks (especially redwood bark), the control of insects and micro-organisms, and reforestation and genetics are reviewed. L.E.W.

WOOD—CHEMISTRY

JAHN, E. C., HOLMBERG, C. V., and SCHUERCH, C. The chemical structure of the constituents of wood. Chemistry in Can. 5, no. 4: 35-42 (April, 1953).

The authors review the field of the chemical structure of wood constituents and give details on the whole wood, cellulose, hemicelluloses, and lignin; the many extraneous components are not discussed in detail, although recent work on lignans, pinosylvin, and thujaplicin is listed. 1 table, 6 figures, and 82 references. E.S.

WOOD—DECAY

ENKVIST, TERJE, SOLIN, EVA, and MAUNULA, URHO. Studies on pine wood decayed by brown rot. Paper and Timber (Finland) 36, no. 3: 65-8, 86 (March, 1954). [In English]

Scotch pine (*P. sylvestris* L.) (I) extensively decayed by brown rot was analyzed as fully as possible, with special emphasis on lignin, α-cellulose, and various extractives. By nitrobenzene oxidation, (I) gave 4.2% vanillin. (I) was subjected to three different sulfite digestions: one by the usual sodium sulfite technique at about pH 2, one with sodium sulfite at above pH 10, and one with sulfurous acid. (I) was easily digested; its lignosulfonic acids were high in sulfur but had no tanning properties. Even very slight methylation of (I) strongly inhibited the acid sulfite digestion. In contrast to this, methylation of (I) causes less retardation of the kraft or soda cooks than does methylation of the sound wood. This is ascribed to carboxyl groups in the lignin of decayed wood which, when methylated, form esters that are saponified in the alkaline digestions. Data are given especially on the lignin fractions of (I) and the lignosulfonates obtained from (I). 5 tables, 1 figure, and 27 references. L.E.W.

WOOD—EXTRACTIVES

DUFF, S. R., and ERDTMAN, H. The chemistry of the natural order *Cupressales*. XI. [Incorrectly listed as X] Nootkatin. Chemistry & Industry no. 15: 432-3 (April 10, 1954); *cf.* B.I.P.C. 23: 445.

A rigorous proof is given for the structure of the tropolone nootkatin (isolated from the heartwood of *Chamaecyparis nootkatensis*). 3 references. L.E.W.

WOOD OPERATIONS

CROSS, GEORGE E. Economics of crushed gravel for use on bush roads. Pulp Paper Mag. Can. 55, no. 4: 120 (March, 1954).

A Universal gravel crusher was used by the St. Lawrence Corp. to deliver crushed gravel on main bush roads. A comparison of costs between crushed

and rough gravel showed that the crushed gravel cost only 17 cents more per cubic yard; savings expected as a result of using crushed gravel and suggestions for others contemplating operation of a crusher are listed. 1 illustration. R.A.S.

WOOD WASTE

DESSEN, ARNE. The utilization of small-dimensioned wood in industry. Norsk Skogind. 8, no. 3: 84-90 (March, 1954). [In Norwegian; English summary]

The technical problems in connection with the use of small-dimensioned wood, sawmill waste, etc. are more or less solved and, at present, not only sulfate and wallboard mills, but also sulfite and groundwood mills are using this raw material. Its use is, however, still limited in Norway, because it is not yet known if sufficient quantities can be supplied regularly at competitive prices. The possibilities of semichemical pulping are listed. Many problems still have to be solved; collaboration between forest owners and mills should bring the required results. E.S.

KAILA, ANJAL. Observations of the waste wood problems and the newest hardboard industry in the U.S.A. Paper and Timber (Finland) 36, no. 3: 77-84, 86 (March, 1954). [In Finnish; English summary]

Recent developments in the utilization of wood waste from logging operations and leftovers from other lumber industries, defective trees, and bark in the United States are reviewed. Many sawmills and plywood factories have opened wallboard mills; new dry and semidry processes have been introduced, particularly on the West Coast. The new methods have many advantages as compared with the old wet process, although the cost of the glue is still comparatively high. In the development of these processes, the Plywood Foundation, Cascade's Plywood Corp., and the Weyerhaeuser Timber Co. have played a pioneering role. Weyerhaeuser should particularly receive credit for its research in integrated forest utilization. 1 table and 3 figures. E.S.

KING, WOODROW W. The effect of log diameter and milling equipment on sawmill residues. J. Forestry 51, no. 12: 897-906 (December, 1953).

The author presents the results of a survey made in East Texas to determine the amount, character, and location of residues accumulated at sawmills. The present investigation was designed to estimate the relative amounts of sawmill residues ascribable to differences among mills with respect to kinds and combinations of equipment, and to estimate the differential effect of log size in the residues within each kind of mill. The study demonstrates that accurate estimates can be obtained through the proper application of statistical methods. 9 tables, 6 figures, and 4 references. E.S.

PYNER, GEOFFREY. Pulping of sawdust. Tappi 37, no. 4: 177-8A (April, 1954).

In an inquiry from the Whakatane Board Mills, Ltd. of Whakatane, New Zealand, the writer asks for possibilities of utilizing the sawdust from *Pinus radiata;* experiments for cooking in semikraft experimental digestions were unsuccessful. Neutral sulfite semichemical cooks will be tried next. J. N. McGovern in a reply refers to an unsatisfactory experience of the Gaylord Container Corp. which attempted to pulp pine sawdust by the neutral sulfite semichemical process. The pulping of a mixture of sawdust and chips might

bring better results. J. S. Martin, in a second reply, arrives at similar conclusions. The pulp from such a mixture would necessarily be lower in strength and cleanliness than pine pulp produced from chips, but could probably be used as filler stock. In previous cooking experiments with sawdust at the Forest Products Laboratory, it has been found that yield of pulp and strength properties decrease with the age of the sawdust. Operating difficulties and troubles caused by sand in the sawdust are listed. E.S.

SIBBERN, VALENTIN. Small-dimensioned wood in the general forest economy. Norsk Skogind. 8, no. 3: 78-83 (March, 1954). [In Norwegian; English summary]

There will always be certain quantities of small-dimensioned wood in Norwegian forests which will have to be cut as a silvicultural measure, even if the felling and transport costs are at present too high to make such harvesting immediately profitable to the forest owner. Since it is possible to utilize these dimensions as a raw material, the problem is to find methods of felling and transportation which make it remunerative. Barking and chipping should be carried out in small plants near the forest, and the chips should then be transported to the mills for further conversion. Although the author deals with the problem from the angle of the forest owner, the utilization of small-dimensioned wood in the mills is a matter of general importance and should be considered by all interested parties. E.S.

X-RAY RESEARCH

HESS, K. Studies on the fine structure of fibrous materials and modifications wrought by chemical changes and through other external causes. Assoc. tech. ind. papetière, Bull. no. 2: 38-52 (1954). [In French]

A brief review of the work on the fine structure of high polymers, especially that involving x-ray diagrams (of which 42 are included) is given. Special emphasis is placed on the suitable preparation of samples required in obtaining sharp x-ray data. Reference is made to the following fibers: cellulose, its acetate and trinitrate, various types of sodium celluloses (in which gradual continuous changes in lattice structure were shown by x-ray studies), several synthetic fibers, and silk fibroin. The action and effects of increasing the percentage of carbon disulfide on sodium cellulose I are also considered. 4 tables, 33 figures, and 5 references. L.E.W.

YELLOWING OF PULP

AALTO, ERKKI O. The discoloring of bleached sulfite pulp. Paper and Timber (Finland) 36, no. 3: 71-6 (March, 1954). [In Finnish; English summary]

Following a brief review of some recent pertinent studies in the field, the results of an extended research on the discoloration (yellowing) (I) of bleached sulfite pulp are reported in condensed form. The purpose of the investigation was the search for means to reduce or prevent (I). All pulps were bleached in several stages involving one or two chlorinations and an alkali and a hypochlorite stage. The bleached pulp samples were subjected to accelerated aging at 110°C. for 24 hours. (I) was found to decrease during chlorination in direct ratio to the chlorine percentage used; double chlorination was more effective than a single process. During the alkali stage, the smallest amount of (I) at room temperature takes place with a 2% addition of sodium hydroxide; when the temperature is raised to 70-80°, (I) decreases distinctly with increases in sodium hydroxide from 0.6-4%. Far less

(I) is found in the hypochlorite stage at 30° than at 40°. Buffering (pH 8) has an effect at 40°, but not at 30°. The final pH of the hypochlorite stage is very significant; when it falls below 7, (I) is considerable. When the pulp consistency in this stage increases from 3 to 12%, (I) increases very rapidly. When bleached pulp is well washed with distilled water, very little (I) will be encountered. The addition of a small amount of a surface-active agent will reduce (I) tendencies further. In both cases improved results will be obtained when the number of washings is increased. If the pulp is first extracted with ether and then made into sheets, (I) will be less than in the original pulp. Results will again be further improved when the extracted pulp is well washed with distilled water. Beating of the pulp and pressing of the sheets increase (I). Acidification of the pulp after bleaching appears to be beneficial; (I) decreases with the use of sulfur dioxide water and cooking liquor for this purpose. The present results seem to indicate that both the very short split fibers and, in bleaching, damaged fibers are fundamental causes of (I) of bleached sulfite pulp. The correct handling of the alkali and hypochlorite stages is important for checking (I). If the pulp after bleaching is strongly acidified, (I) decreases. Thorough washing with water between the single stages will also improve conditions. 1 table, 16 figures, and 6 references.

E.S.

Patent Section

Although the abstracts of the United States and Canadian patents are prepared from the patents themselves, the initial selection of the patents to be abstracted is made from the Patent Gazette *and the* Canadian Patent Office Record *and, therefore, it is possible that the patent section will not contain all patents of potential interest to the industry. In so far as possible, an attempt will be made to indicate patents issued in both countries.*

The patent abstracts are listed under the various headings currently used for the abstracts of periodical articles.

Printed copies of United States patents can be obtained from the Commissioner of Patents, Washington, D.C.; the price is 25 cents per copy. Canadian patents up to and including December, 1948, are available only as manuscripts or photostatic copies, and an estimate of the cost of a patent should be obtained from the Commissioner of Patents, Ottawa, Canada, in advance of the order. Printed copies of Canadian patents are available at 50 cents per copy. Beginning with volume 21, the Canadian patents are abstracted from the complete specifications.

ADHESIVES

BAKER, CHESTER L., and SAMS, ROBERT H. Manufacture of water-resistant machine-fabricated laminated fiber products and adhesives therefor. Canadian patent 500,754. Filed Dec. 26, 1946. Supplementary disclosure filed Feb. 16, 1952. Issued March 16, 1954. 20 claims. Assigned to National Silicates Limited.

A water-resistant adhesive useful in the manufacture of laminating or corrugating boards comprises a mixture of about 10% vegetable protein (e.g., Prosein), 5% starch, and 40-50% sodium silicate with a sodium oxide to silicon dioxide ratio of 1 : 3.22. The working life of these adhesives is claimed to vary from about 15 minutes to 8-12 hours. 7 figures. W.B.W.

BROWN, RODNEY G. Bookbinding adhesives. Canadian patent 501,095. Filed April 5, 1947. Issued March 30, 1954. 8 claims. Assigned to E. I. du Pont de Nemours and Company.

A synthetic linear polyamide [described in U. S. patent 2,285,009 (June 2, 1942) and U. S. patent 2,430,860 (Nov. 18, 1947)] and a compatible liquefying softener—such as coumarone indene-phenolic condensate (Nevillac TS) or chlorinated diphenyl—are claimed to make a tough waterproof bookbinding adhesive which will not deteriorate on long exposure to air. W.B.W.

AIR FILTERS

GROSS, WILLIAM E., HALE, FRANK B., and BROWN, IRVING C. Trimming and wrapping machine. U. S. patent 2,672,196. Filed April 13, 1936. Issued March 16, 1954. 15 claims. Assigned to United States of America as represented by the Secretary of War. [Cl. 164-42]

Low tensile-strength filter paper (for gas-mask air filters) is passed between rotary trimming knives driven at a speed directly proportional to the speed of the paper; this is important to prevent the tearing of the edges of the relatively weak paper. A predetermined number of layers of the trimmed paper is wrapped around the canister insert prior to its incorporation into the canister body. 9 figures. W.B.W.

ALKALINE PROCESSES

HARRIS, GEORGE C. Alkaline pulping using gaseous oxygen. U. S. patent 2,673,148. Filed Oct. 4, 1950. Issued March 23, 1954. 6 claims. Assigned to Hercules Powder Company. [Cl. 92-9]

Pulping of cellulosic materials (e.g., softwoods, hardwoods, flax, hemp, jute, etc.) with gaseous oxygen under pressures of at least 800 p.s.i. at temperatures of 125-175°C. for two to five hours and in the presence of an alkaline solution of sodium bicarbonate, sodium benzoate, sodium phenolate, or the like is claimed. The pH is maintained between 7 and 9 during the pulping period to produce a high yield of substantially lignin-free holocellulose. Ligneous materials and resins may be recovered from the pulping liquors by partial evaporation and acid precipitation or by passage through an ion-exchange column. W.B.W.

WESTCOTT, DANA B., and FIELD, HAROLD L. Manufacture of pulp by the alkaline process. U. S. patent 2,671,727. Filed May 5, 1948. Issued March 9, 1954. 8 claims. Assigned to West Virginia Pulp and Paper Company. [Cl. 92-9]

A group of digesters are connected in parallel between liquor supply and return manifolds through which liquor is continuously circulated so that each digester, as the cooking schedule is completed, may be blown, refilled with chips, and returned to the system without interfering with the operations of the other units. A reserve of cooking liquor is maintained in the accumulator and the chemical content of the liquor returning to the digesters is sampled, tested, and fortified with fresh liquor as required. Liquor entering the digester is maintained between 145 and 175°C. with a sodium oxide content of from 10 to 20 grams/liter. Pulp of a more uniform quality, as well as a more uniform steam demand, is claimed for the system. 1 figure. W.B.W.

ALKALINE PROCESSES—FURNACES

GREENAWALT, JOHN E. Method and apparatus for recovering chemical products from waste materials. U. S. patent 2,673,787. Filed Jan. 18, 1946. Issued March 30, 1954. 21 claims. [Cl. 23-48]

A furnace for the recovery of heat and chemicals from a soda process or similar spent liquor is lined with coils through which liquid coolant is circulated to control the temperature within the combustion chamber. The wheel-type burner unit is suspended through the roof of the furnace and throws a ring of atomized concentrated spent liquor into the combustion zone surrounding the burner. Molten noncombustible slag (e.g., sodium carbonate) forms a refractory crust of controlled thickness on the cooling pipes; the molten portion of the material flows out of the furnace through a draw-off spout into the dissolving tank for recausticizing. 7 figures. W.B.W.

ALUMINUM

STEWART, LAWRENCE E. Disposable cooking utensil. U. S. patent 2,673,003. Filed Feb. 2, 1951. Issued March 23, 1954. 1 claim. [Cl. 220-72]

An aluminum foil baking tray incorporates a series of lengthwise ridges in the bottom of the tray, formed by folding the sheet material, to support the contents above the flat bottom. 4 figures. R.A.S.

ANTI-STICKS

GILCREASE, JOHN R. Dusting of rubberlike materials with cellulose. U. S. patent 2,673,844. Filed Dec. 22, 1950. Issued March 30, 1954. 7 claims. Assigned to Standard Oil Development Company. [Cl. 260-17.4]

Coalescence of butadiene-nitrile and like materials when stored as crumbs is prevented by dusting the crumbs with 1-4% of powdered, lignin-free, fibrous wood cellulose reduced in size so that at least 65% of the ground particles pass through a 100-mesh screen. W.B.W.

ASBESTOS

NOVAK, IZADOR J. Asbestos dispersions and method of forming same. Canadian patent 500,963. Filed Dec. 16, 1949. Issued March 23, 1954. 14 claims. Assigned to Raybestos-Manhattan, Inc.

The production of high-strength, smooth-paper webs from stable aqueous colloidal dispersions of chrysotile asbestos fibers containing an organic colloidizing agent is claimed. This is the same as U. S. patent 2,626,213 (Jan. 20, 1953); *cf.* B.I.P.C. 23: 448. 6 figures. W.B.W.

BARKERS AND BARKING

EFURD, ROBERT L., JR., and EFURD, EULAND A. Adjustable cutter head for bark-removing machines. U. S. patent 2,671,480. Filed June 23, 1948. Issued March 9, 1954. 5 claims. [Cl. 144-208]

The cutter head of a portable barker is controlled by the operator and may be raised as necessary to pass over branch stubs, etc. Toothed wheels feed the log under the cutter head and are likewise controlled by the operator. 9 figures. W.B.W.

KAFKA, MIKE P. Portable log peeler. U. S. patent 2,672,899. Filed Nov. 28, 1952. Issued March 23, 1954. 3 claims. Assigned 33⅓% to Martin A. Benda and 33⅓% to George A. May. [Cl. 144-208]

The motor in this hand-operated log peeler drives an eccentric which, in turn, causes the blade to reciprocate in slots on the forward end of the frame. An apron, fixed at an angle to the blade, forces the bark upward as the blade is forced between bark and log. 6 figures. W.B.W.

BOARD

GOSS, WORTH C. Method of manufacturing sheet lumber. U. S. patent 2,673,370. Filed Aug. 17, 1951. Issued March 30, 1954. 13 claims. Assigned to The Sheetwood Products Company. [Cl. 18-47.5]

This is an improvement on U. S. patent 2,542,025 (Feb. 20, 1951; *cf.* B.I.P.C. 21: 505) wherein the layer of lignocellulosic material adjacent the pressing platens has a moisture content of about 100%, whereas that of the body material contains only 5-70% moisture. The sheet is consolidated by heat and pressure and possesses dense surface layers and a less dense body portion as a result of the different moisture contents of the several layers. A substantial reduction of dwell time in the press is claimed for the use of controlled moisture in the unit. 2 figures. W.B.W.

BOARD—COATED

ROTHER, RICHARD J., and MCMANUS, ALBERT R. Coating composition for paperboard comprising an aqueous dispersion of a butadiene-styrene copolymer and a hydrous aluminum silicate clay. U. S. patent 2,672,454. Filed March 25, 1953. Issued March 16, 1954. 6 claims. Assigned to Gaylord Container Corporation. [Cl. 260-17.4]

A coating composition for paperboard containers used for packaging hot bituminous materials is compatible with such materials. Hydrous aluminum silicate clay and a butadiene-styrene copolymer in aqueous emulsion comprise the major ingredients of a coating which is applied to the board by conventional equipment before the blanks are scored. A relatively weak bond is formed between the coating and the paperboard so that the asphaltic material may be removed from the carton without clinging to the container walls; the coating strips from the board and adheres to the packaged material.

W.B.W.

BOARD, ASBESTOS

MAGNANI, ALESSANDRO. Apparatus for feeding reinforcing elements for incorporation in cementitious sheets. U. S. patent 2,672,076. Filed July 9, 1951. Issued March 16, 1954. 2 claims. Assigned 50% to F. L. Smidth & Co. A/S. [Cl. 92-40]

This device incorporates a series of reinforcing wires into asbestos-cement sheets during the process of applying the slurry to the corrugated form. 10 figures. W.B.W.

BOARD, CORRUGATED

WENZELBERGER, ELWOOD P., and WOHL, KURT A. Process for making crush resistant boxboard. U. S. patent 2,670,663. Filed May 3, 1951. Issued March 2, 1954. 3 claims. Assigned to The Weston Paper and Manufacturing Co. [Cl. 92-39]

A starch-urea-formaldehyde resin mixture to improve crush resistance is cooked under controlled conditions of pH to produce a material suitable for addition to corrugating-medium stock at some point such as the headbox. The resin is progressively polymerized during subsequent operations of sheet drying, corrugating, and application of the liner. The conditions of resin production are adjusted depending upon the furnish of the stock used and the board-forming operations encountered so that polymerization is completed with the final operation. 1 flowsheet. W.B.W.

BOARD, INSULATING

BOURGEOIS, CHARLES. Sound-absorbing panel. U. S. patent 2,671,522. Filed March 31, 1950. Issued March 9, 1954. 1 claim. [Cl. 181-33]

Fibrous material from wood, spun glass, or the like is formed into a sound-absorbing panel, then grooved with two sets of grooves perpendicular to each other and alternately deep and shallow. Several variations of the above are described. 17 figures. W.B.W.

BOARD SPECIALTIES

AKERS, VICTOR. Shirt protector. U. S. patent 2,673,015. Filed Sept. 26, 1949. Issued March 23, 1954. 5 claims. [Cl. 223-71]

A shirtboard and an integrally connected strip which is curved and interlocked to form a collar support are cut from a sheet of cardboard or other suitable paper stock. 5 figures. R.A.S.

D'AMBROSIO, ANTHONY. Method of making compact holders. U. S. patent 2,671,384. Filed Feb. 10, 1951. Issued March 9, 1954. 3 claims. [Cl. 93-36]

Two paperboard blanks are each covered on one side with fabric, formed into open-end boxes, and combined with the covered sides outward. The box is cheaper to make than those requiring hand work on the covering and is used to hold a compact or vanity case in a pocketbook. 5 figures. W.B.W.

DANZIGER, PHILIP F. Shirt packaging form. U. S. patent 2,671,581. Filed Nov. 24, 1951. Issued March 9, 1954. 5 claims. Assigned to Market Industries Co., Inc. [Cl. 223-71]

A combination shirtboard and collar support is made from paperboard; notched flaps hold the collar cover in place. A paper band holds the body of the shirt. 4 figures. R.A.S.

PRICE, ALFRED S. Storage battery top protector. U. S. patent 2,671,599. Filed July 25, 1950. Issued March 9, 1954. 3 claims. [Cl. 229-16]

A slip-over cover for electric wet-storage batteries is formed from a single blank of corrugated cardboard material; an inner top wall section is scored to outline the usual terminals, cell connecters, and filling caps extending above the main cells. The outer top wall and the four side-wall sections are double or triple ply for protection. 13 figures. R.A.S.

RANSEEN, MAURITZ C. Card supporting device. U. S. patent 2,670,916. Filed Feb. 16, 1950. Issued March 2, 1954. 12 claims. [Cl. 248-35]

Articles such as posters, display cards, photographs, etc. are supported for display by an easel device formed from a single blank of sheet material such as paper, plastic, or light metal. Two flaps fold back and interlock to hold the main panel in upright position; a double fold or a metal clamp at one corner holds the object to be displayed. 26 figures. R.A.S.

RICHMAN, NURNEY H. Shirt package and blank for forming same. U. S. patent 2,673,667. Filed Feb. 9, 1953. Issued March 30, 1954. 9 claims. Assigned to Scientific Packages, Inc. [Cl. 223-71]

A shirtboard and collar-support combination is provided with a tab for interlocking the protector with the collar of the shirt; the device is cut from a single sheet of fibrous material such as cardboard. 9 figures. R.A.S.

RINGLER, WILLIAM A. Fully partitioned carrier with reinforced handle. U. S. patent 2,673,677. Filed April 7, 1950. Issued March 30, 1954. 4 claims. Assigned to The Gardner Board and Carton Co. [Cl. 229-28]

A paperboard bottle carrier (which can be completely manufactured in the knocked-down condition) involves a double central section reinforced with flaps folded down above a hand-hole cutout and a partition structure integral with the side walls with tabs adhesively secured to the central handle. 14 figures. R.A.S.

SAHLEN, HENRY P. Garment hanger. U. S. patent 2,671,582. Filed Nov. 10, 1950. Issued March 9, 1954. 3 claims. [Cl. 223-98]

A cover for application to ordinary wire hangers is formed of sheet material such as a rigid cardboard and extends beyond the hanger to afford sufficient support to the garments without formation of creases. 2 figures. R.A.S.

BOILER SCALE

BERGMAN, WILLIAM E. Use of ion-exchange materials for removal of scale deposits. U. S. patent 2,671,035. Filed Nov. 16, 1948. Issued March 2, 1954. 5 claims. Assigned to Phillips Petroleum Company. [Cl. 134-7]

The removal of scale from equipment such as boilers, tanks, pipes, etc. in which an ion-exchange material (such as zeolite) is circulated through the equipment by pumping or other means is claimed. The particle size of the ion-exchange material should be sufficiently small to insure easy flowing with the carrier liquid and sufficiently large to make it easily filterable. The process is usually carried out at temperatures not in excess of 100°C. W.B.W.

CALCIUM CARBONATE

SCHUR, MILTON O., and LEVY, ROBERT M. Process of producing calcium carbonate. U. S. reissue patent 23,794. Filed April 29, 1953. Issued March 2, 1954. 4 claims. Assigned to Ecusta Paper Corporation. [Cl. 23-66]

Noncolloidal calcium carbonate is produced by the introduction of carbon dioxide into a slaked lime slurry until substantially all of the calcium hydroxide has been converted. This is a reissue of U. S. patent 2,631,922 (March 17, 1953); *cf.* B.I.P.C. 23: 597. W.B.W.

CELLULOSE ETHERS

JENKINS, ROY H., JR. Method of bleaching cellulose derivatives. U. S. patent 2,662,884. Filed May 17, 1951. Issued Dec. 15, 1953. 15 claims. Assigned to Hercules Powder Company. [Cl. 260-232]

Cellulose ethers, especially those prepared from wood pulp, may be effectively bleached with sodium chlorite solution after the ether has been slurried in methanol solution. The chlorite solution is activated with a small amount of hypochlorite and the pH adjusted with glacial acetic acid to a value of 6.5 to 7.5. W.B.W.

COMBINATION PACKAGES

TARDIFF, RAY O. Combination package. U. S. reissue patent 23,806. Filed Dec. 29, 1953. Issued March 23, 1954. 2 claims. Assigned to Breyer Ice Cream Company. [Cl. 229-15]

The package consists of a conventional paper carton member and a tray member to be inserted within the carton. It is designed for cup cakes, ice-cream tarts, and the like. This is a reissue of U. S. patent 2,617,577 (Nov. 11, 1952); *cf.* B.I.P.C. 23: 291. 5 figures. R.A.S.

CONTINUOUS COOKING PROCESS

SEGL, WALTER E. Method for the digestion of cellulose-bearing material. U. S. patent 2,673,690. Filed Oct. 27, 1951. Issued March 30, 1954. 9 claims. Assigned to Hercules Powder Company. [Cl. 241-3]

Wood chips, straw, cotton linters, and other cellulosic materials are digested in an apparatus which embodies a feed device wherein the wetted cellulosic material mixed with chemicals is compacted by a screw within a tubular chamber and forced as a plug against a ram controlled by air or hydraulic pressure. The plug acts as a seal to prevent loss of pressure in the digestion chamber. The ram is forced backward by the plug until the pressure causes the plug to disintegrate at which time the ram moves forward to seal the opening until a plug is again formed and the above process repeated. The digestion is carried out in a series of chambers equipped with screw conveyors and maintained at elevated temperature and pressure by admission of steam. A discharge device similar to the feed device described above releases the material into a chamber provided with a blow valve, which intermittently vents the disintegrated digested material to the receiving tank where it is slurried for further treatment. 6 figures. W.B.W.

DE-INKING

ZÜNDEL, JEAN E., and ARIES, ROBERT S. Deinking. U. S. patent 2,673,798. Filed July 20, 1949. Issued March 30, 1954. 3 claims. [Cl. 92-1.5]

The use of a caustic extract of coniferous bark (pine and spruce are mentioned, and fir is indicated as especially suitable) in conjunction with a detergent (e.g., sodium silicate or trisodium phosphate) and caustic soda is claimed to be effective in deinking of newsprint. Fresh bark consumption amounts to about 6.2% based on the weight of newsprint with about 3.25% caustic soda consumed on the same basis. Steamed bark is preferred because of the ease of extraction and also because it does not impart color to the pulp. W.B.W.

DISINFECTION AND DISINFECTANTS

WOLFERT, EUGEN, and DAAB, HANSHEINZ. Organic disinfecting agents in a special form. Canadian patent 500,815. Filed May 23, 1940. Issued March 16, 1954. 5 claims. Assigned to Winthrop Chemical Company, Inc.

Organic disinfecting agents in sheet or leaf form for easy dispersion are made by producing a melt of the agent and applying it to a carrier such as paper ribbons or cellulose films by pouring or dipping. W.B.W.

DISPENSING CONTAINERS

NORDQUIST, RONALD E. J. Fiber container with duplex closure member. U. S. patent 2,673,021. Filed April 28, 1949. Issued March 23, 1954. 5 claims. Assigned to American Can Company. [Cl. 229-7]

A paperboard milk carton embodies a friction-plug closing for sealing the pouring opening and an overcap over the entire top of the carton adhesively secured opposite the pouring opening and crimped under the overhanging top to provide protection for the contents of the carton. 6 figures. R.A.S.

ROSS, COLIN A. Dispensing carton. U. S. patent 2,672,979. Filed March 21, 1950. Issued March 23, 1954. 1 claim. Assigned to Behr-Manning Corporation. [Cl. 206-60]

A dispensing carton (e.g., for abrading disks) comprises an outer box of comparatively light cardboard or paper material and an inner drawer of relatively heavy cardboard or the like. The drawer may be pulled from the box to expose the contents, extract a portion, or fill the drawer without removing the carton from its stacked position. 6 figures. R.A.S.

TAYLOR, RUSSELL C. Container with flat top and integral overcap. U. S. patent 2,671,596. Filed Nov. 18, 1948. Issued March 9, 1954. 6 claims. Assigned to American Can Company. [Cl. 229-7]

A top closure for a paperboard milk carton is claimed wherein a plug element is formed to seal the pour opening, and an overlapping cover section is crimped in place to protect the opening from contamination during handling. 7 figures. R.A.S.

DYES AND DYEING

FIDELL, LOUIS I. Method of blending fibers. U. S. patent 2,671,250. Filed May 21, 1952. Issued March 9, 1954. 12 claims. Assigned to American Cyanamid Company. [Cl. 19-146]

Blending of two or more fibrous components is controlled by first dyeing at least one component with a fluorescent dye, not visible under daylight, and mixing until inspection under ultraviolet light shows satisfactory results. These fluorescent agents do not interfere with subsequent dyeing operations. W.B.W.

ERADICATORS

STEINHARDT, DAVID W. Eradication of marks from reactant record material. U. S. patent 2,672,396. Filed June 23, 1951. Issued March 16, 1954. 10 claims. Assigned to The National Cash Register Company. [Cl. 8-102]

The method of eradicating marks on reactant record material is similar to that covered by U. S. patent 2,669,503 (Feb. 16, 1954; *cf.* B.I.P.C. 24: 672-3). In addition to acetic acid, the use of propionic, butyric, ethylhexoic, or hydrochloric acids is claimed; methyl ethyl ketone or ethyl acetate may be substituted for acetone. W.B.W.

FOLDING BOXES

CRANE, WALTON B. Container. U. S. patent 2,672,274. Filed July 29, 1949. Issued March 16, 1954. 2 claims. Assigned to Max Factor & Co. [Cl. 229-37]

A collapsible carton formed from a single blank of paperboard consists of a top opening panel with a decorative cutout and a cover panel integral with one side wall comprising three thicknesses. Closure flaps sealed with glue reinforce the bottom wall. 5 figures. R.A.S.

FOYLE, JOHN R., and BOWLER, BERTRAM T. Carton for containing electric lamp bulbs and like fragile articles. Canadian patent 500,292. Filed Feb. 15, 1951. Issued March 2, 1954. 22 claims. Assigned to Boxfoldia Limited.

A cardboard carton for electric lamp bulbs and other fragile articles has end flaps integral with the side walls which are folded inwardly to hold both ends of the bulb securely. 25 figures. R.A.S.

GOERS, EDWIN C. Carton. Canadian patent 500,738. Filed July 25, 1953. Issued March 16, 1954. 1 claim. Assigned to Marathon Corporation.

This is identical with U. S. patent 2,650,751 (Sept. 1, 1953); *cf.* B.I.P.C. 24: 238-9. 20 figures. R.A.S.

LA BOMBARD, LEON E. Collapsible box. U. S. patent 2,673,679. Filed Aug. 27, 1948. Issued March 30, 1954. 5 claims. [Cl. 229-38]

A collapsible cardboard box is provided with reinforcement by an extension of one of the side flaps to the length required for forming double walls on three sides of the main carton. 13 figures. R.A.S.

PFAFF, HAROLD A. Carton. Canadian patent 500,538. Filed July 22, 1953. Issued March 9, 1954. 7 claims. Assigned to Marathon Corporation.

This is the same as U. S. patent 2,652,969 (Sept. 22, 1953); *cf.* B.I.P.C. 24: 239. 10 figures. R.A.S.

RUDINE, CLIFFORD. Multiple section container. U. S. patent 2,672,275. Filed Jan. 9, 1950. Issued March 16, 1954. 4 claims. [Cl. 229-37]

A container constructed from a single blank of cardboard or the like comprises two sections and a cutout portion with flaps between. The flaps in the center are folded and secured in such a manner that the carton can ultimately be separated into two completely sealed cartons. 7 figures. R.A.S.

SMITH, THOMAS K. Carton. U. S. patent 2,672,273. Filed June 14, 1949. Issued March 16, 1954. 5 claims. [Cl. 229-37]

A continuous strip of paperboard, cardboard, or other suitable material divided into eight sections is formed into a double-walled carton. The outer carton incorporates a line of weakness near the top on three sides thus providing a hinged easily opened cover telescoping over a locking flap of an inner-layer panel to provide locking action. 15 figures. R.A.S.

INSULATION AND INSULATING MATERIALS

CHAVANNES, MARC A., and HOWDEN, JAMES W. Method and apparatus for bonding fibers together. U. S. patent 2,671,496. Filed March 23, 1950. Issued March 9, 1954. 11 claims. Assigned to Chavannes Industrial Synthetics, Inc. [Cl. 154-29]

Cotton, jute, glass, or other fibers are deposited on a moving belt along with thermoplastic resin in powdered form; then a stream of hot air is passed through the pad from alternate sides to melt the resin, followed by a stream of cold air to set it. The pads so produced may be used for wearing apparel and packing or insulating material. 5 figures. W.B.W.

INTERIOR PACKING

TAYLOR, HARWOOD S., JR. Folding box packer and carrier. U. S. patent 2,671,584. Filed March 6, 1950. Issued March 9, 1954. 1 claim. Assigned to F. M. Howell & Co. [Cl. 224-48]

Packing constructed from a single blank of cardboard or the like is cut to hold fragile articles such as cups or plates firmly in position. A handle is incorporated in the center and, on removal from the shipping container, the packing is folded in the center, swinging the handle upright and forming a carrier. 8 figures. R.A.S.

LEATHERBOARD AND ARTIFICIAL LEATHER

ENSSLIN, KURT, and RATHERT, HERMANN. Process for the production of porous foils from viscose. U. S. patent 2,670,500. Filed Aug. 8, 1950. Issued March 2, 1954. 10 claims. Assigned to Vereinigte Glanzstoff-Fabriken A. G. [Cl. 18-47.5]

Synthetic chamois of controlled porosity and thickness is produced from viscose to which fibers of cotton, hemp, or the like, and water-soluble, pore-forming agents have been added. The material is rolled to a thin layer and pressed between heated plates, then washed to remove the pore-forming agents. 2 figures. W.B.W.

LIGNIN

KUNZ, ERIC C., WESTON, WILLIAM H., JENNISON, MARSHALL W., SWEET, HERMAN R., and KITCHENS, GARRY C. Process for forming a lignin concentrate. U. S. patent 2,671,751. Filed Dec. 3, 1948. Issued March 9, 1954. 5 claims. Assigned to The Givaudan Corporation. [Cl. 195-2]

A lignin concentrate of at least 35% is produced by the action of selected fungi (*Fomitopsis roseus, Lentinus lepideus, Polyporus palustris,* etc.) on meal prepared from pine, hemlock, redwood, birch, and other hard- or soft-woods in the presence of nutrients such as peptone, corn steep liquor, soybean meal, etc. The stock cultures of fungi are mixed with sterilized wood and nutrient and maintained at 27-32°C. to produce concentrates within a period not in excess of 90 days. Wood which is not suitable for direct conversion into vanillin by known processes can be so converted after application of the above process. W.B.W.

MACHINERY—CHIPPERS

VAUGHAN, WILLIAM K. Wood chipper. Canadian patent 501,053. Filed Dec. 12, 1951. Issued March 30, 1954. 5 claims.

This is identical with U. S. patent 2,663,506 (Dec. 22, 1953); *cf.* B.I.P.C. 24: 499. 5 figures. W.B.W.

MACHINERY—CONVERTING MACHINERY

EVERS, ARTHUR J. Striker mechanism for bagmaking machines. U. S. patent 2,673,610. Filed April 3, 1952. Issued March 30, 1954. 5 claims. Assigned to International Paper Company. [Cl. 164-36]

Draw rolls carry the bag tubing over the forming plate and a constantly rotating striker severs the tubing into bag lengths when pinch rolls mo-

mentarily interrupt the advance of the web. This device is particularly useful in connection with high-speed machines making automatic-bottomed bags. 11 figures. W.B.W.

HARKER, CHARLES B. Packaging machine. U. S. patent 2,673,431. Filed April 30, 1953. Issued March 30, 1954. 11 claims. Assigned to Harold L. Bartelt and Donald E. Bartelt. [Cl. 53-89]

A strip of heat-sealable material or sheet material coated with the same is folded with the open edges upward, formed into pouches by sealing units mounted on either side of the advancing web, and the web is severed to form individual bags. Positive opening of the bag at the filling station is assured by the use of a splitter bar in the open end of the bag, said bar extending from the point of bag formation to the filling station. 6 figures. W.B.W.

HECKER, LEONARD R., and CLARK, MURRAY P. Method and apparatus for making bags. U. S. patent 2,673,495. Filed March 13, 1946. Issued March 30, 1954. 5 claims. Assigned to Continental Can Company, Inc. [Cl. 93-35]

A machine for the manufacture of bags of the type commonly used by dry cleaning establishments for covering garments is claimed. Adhesive in the liquid state is applied to selected areas of the web, and the web is folded and formed into a tube. The machine is also claimed to be adaptable for the formation of multiwall bags. 19 figures. W.B.W.

HEITMANN, HANS. Machine for the manufacture of envelopes and flat bags with inside arranged folding seams. U. S. patent 2,673,497. Filed May 4, 1950. Issued March 30, 1954. 9 claims. [Cl. 93-63]

A supply roll of paper is printed, marginal portions cut to leave flaps, adhesive applied to the flaps, and the web cut into predetermined lengths and folded with the gummed-flap portions inside the envelope or bag. The completed units are carried by a conveyor through a drying drum and delivered to a stacking means within the machine. Ease of accessibility and adjustment for various sizes are features of the unit. 7 figures. W.B.W.

HEITMANN, HANS. Machine for the production of envelopes, flat paper bags, and the like. U. S. patent 2,670,664. Filed May 13, 1950. Issued March 2, 1954. 2 claims. [Cl. 93-62]

Precut blanks for envelopes are printed, gummed, folded, and dried in the machine claimed; the closure flap may be gummed if desired. The direction of the work passage is changed several times in the travel through the machine to conserve space and reduce the height of the machine. 3 figures. W.B.W.

HONSEL, CARL. Sidefold paper and like bags and a method and apparatus for their production. Canadian patent 501,040. Filed Oct. 11, 1951. Issued March 30, 1954. 8 claims.

Side-fold bags of paper and the like with square bottoms are made by applying thermoplastic adhesive such as dextrin rubber latex in a triangular pattern and bringing these adhesive-coated areas together in the bag-forming machine. 6 figures. W.B.W.

JOHENNING, FRANZ, and BAUMS, OTTO. Method and mechanism

for unfolding, refolding, setting up, and transporting tubular cartons in spaced relationship. U. S. patent 2,671,385. Filed Feb. 13, 1952. Issued March 9, 1954. 19 claims. Assigned 50% to Jagenberg-Werke Akt.-Ges. [Cl. 93-53]

Flattened tubular carton blanks are removed from a stack by a feed wheel, refolded to break the fold lines, and then directed into compartments of a conveyor in the set-up condition. 6 figures. W.B.W.

JUNGMAYR, THEODOR. Folding mandrel for making bags. U. S. patent 2,671,383. Filed March 29, 1951. Issued March 9, 1954. 4 claims. Assigned to Firma Fr. Hesser, Maschinenfabrik-Aktiengesellschaft. [Cl. 93-12]

A group of mandrels are mounted around a central shaft through which a control rod, connected to the mandrels, operates. After the precut blanks are formed around the mandrel, the sections of said mandrel are contracted to enable easy removal of the finished bag. 6 figures. W.B.W.

PALMER, CHARLES E. Container forming machine. Canadian patent 500,953. Filed July 5, 1948. Issued March 23, 1954. 10 claims. Assigned to Package Machinery Company.

A precut blank with slits in the side walls and locking tabs on the end walls is forced through a forming well by a mandrel to produce a tray-shaped carton. 9 figures. W.B.W.

PETERSON, HOWARD B., and DE GEAR, EDWARD. Container closing machine with centering device. U. S. patent 2,672,791. Filed March 28, 1952. Issued March 23, 1954. 7 claims. Assigned to American Can Company. [Cl. 93-39.2]

A machine for providing rectangular fiberboard-bodied containers of the type used for packaging frozen foods with metal end closures is claimed. Fingers center the container on the lifting pad just prior to engagement of the closing head. 7 figures. W.B.W.

REED, LOU C. Apparatus for manufacturing wallboard joint tape. U. S. patent 2,671,990. Filed May 1, 1950. Issued March 16, 1954. 9 claims. Assigned to The Marvan Corporation. [Cl. 51-75]

The edges of wallboard joint tape are beveled first on one side, then on the reverse side, by a pair of axially mounted grinding wheels which reduce the thickness of the edge to make a smooth joint when applied. 13 figures. W.B.W.

THORSELL, EDWARD P. Apparatus for manufacturing wallboard joint tape. U. S. patent 2,671,991. Filed Nov. 10, 1951. Issued March 16, 1954. 4 claims. Assigned to The Marvan Corporation. [Cl. 51-75]

This machine is quite similar to the one described in U. S. patent 2,671,990 (March 16, 1954; *cf.* abstract above). An adjustable gaging device is incorporated to check the correct angle of the grinding wheels. 13 figures. W.B.W.

VOGT, CLARENCE W. Apparatus for producing enwrapments in

series. U. S. patent 2,671,382. Filed Feb. 14, 1949. Issued March 9, 1954. 8 claims. [Cl. 93-1]

A web of wrapping material is fed into the machine where it is printed, scored, and perforated for the indexing mechanism, and the adhesive is applied to selected areas; then the individual bags are filled and severed from the web. 5 figures. W.B.W.

MACHINERY—CONVEYORS

STRECKER, GERALD. Conveyer driving means for sheet cutting and stacking devices. U. S. patent 2,670,955. Filed Aug. 24, 1950. Issued March 2, 1954. 2 claims. Assigned 50% to Kommandit-Gesellschaft, Dr. Otto C. Strecker, and 50% to Maschinenfabrik zum Bruderhaus Gesellschaft mit beschränkter Haftung. [Cl. 271-76]

The web feed to a high-speed transverse cutter and the several conveyors which carry the sheets after severing from the web are co-ordinated for the most efficient operation. The units which comprise the sheet-handling system are operated at the highest possible speed consistent with sheet size, weight, etc. 3 figures. W.B.W.

MACHINERY—COUNTERS

WAGNER, KENNETH A. Sheet counter for paper sheet handling machines. U. S. patent 2,673,498. Filed April 8, 1952. Issued March 30, 1954. 2 claims. [Cl. 93-93]

A toothed wheel is mounted above the conveyor of a folding machine and engages the folded edges of the sheets as they are advanced in overlapped relation. A marking pencil mounted on the toothed wheel makes a mark on the fold of every predetermined numbered sheet. 7 figures. W.B.W.

MACHINERY—CUTTERS

HALPERN, BERNARD R. Paper-cutting machine. U. S. patent 2,672,197. Filed Feb. 2, 1950. Issued March 16, 1954. 17 claims. [Cl. 164-55]

The blade of the paper cutter descends through the pile with a slicing motion, rather than with the shearing action generally employed, thereby making a relatively lightweight construction of the machine possible. Back and side gages aid in positioning the paper to be cut; the clamp must be in holding engagement with the paper before the knife can be actuated. 8 figures. W.B.W.

MACHINERY—CYCLONE CLASSIFIERS

SCHMID, OTTO. Cyclone separator for separating solid particles from gases. U. S. patent 2,672,215. Filed Aug. 16, 1951. Issued March 16, 1954. 4 claims. [Cl. 183-84]

Air-transported solid particles enter the upper chamber of this device with a cyclonic motion with the particles thrown by centrifugal force to the outer wall of the chamber. At the point where the upper chamber joins the hopper, a frustoconical baffle directs the particles outward and downward for collection at the bottom of the hopper. Air relieved of the entrained particles is

directed upward through the center of the centrifugation chamber and out the effluent-gas passageway at the top of said chamber. 7 figures. W.B.W.

MACHINERY—DOCTORS

SCOTT, HAROLD E. B. Doctor for paper and like machines. U. S. patent 2,673,494. Filed Nov. 29, 1951. Issued March 30, 1954. 8 claims. [Cl. 92-74]

The holder for the doctor blade comprises a longitudinal recess within which a slotted rod or sheet metal insert is held. This insert positions the doctor blade in the holder and makes it possible to remove the blade either from the front or the end of the doctor. Blades of different shapes may be used by replacing the insert without disturbing the holder bar. 15 figures. W.B.W.

MACHINERY—FELTS

CHAGNON, ZEPHIR J. Papermakers felt. Canadian patent 501,062. Filed Dec. 13, 1946. Issued March 30, 1954. 14 claims. Assigned to Albany Felt Company of Canada, Ltd.

Filler yarns of the felt comprise fibers of wool and a synthetic resin (nylon) in an amount varying from 5 to 70%. This is identical with U. S. patent 2,423,828 (July 15, 1947); *cf.* B.I.P.C. 17: 738-9. 3 figures. W.B.W.

MACHINERY—FILTERS

CURTIS, RUSSELL H. Disposable liquid filter element. U. S. patent 2,670,851. Filed June 7, 1949. Issued March 2, 1954. 6 claims. Assigned to Hawley Products Company. [Cl. 210-120]

Conical-shaped, molded filter elements, made from kraft pulp, cotton linters, or synthetic fibers and treated with wet-strength resins such as melamine-formaldehyde, may be employed as a single element or stacked to utilize a number of units, thus increasing the available surface. A shoulder molded on the convex side of the element acts as a spacer between disks and reinforces the center opening. 6 figures. W.B.W.

LABRECQUE, THEODORE A., and PROULX, EUGENE H. Filtering material, filter unit, and method of making the same. Canadian patent 500,522. Filed Oct. 17, 1945. Issued March 9, 1954. 4 claims. Assigned to The Hilliard Corporation.

A sheet of fibrous material, preferably composed of redwood bark and cotton linters, is wrapped around a perforated metal cylinder and enclosed in a cylinder of expanded metal lath to provide a cartridge suitable for filtering oils and like materials. 16 figures. W.B.W.

MACHINERY—PACKAGING MACHINERY

BRYANS, HARRY C. Roll crimping machine. U. S. patent 2,660,846. Filed March 10, 1952. Issued Dec. 1, 1953. 5 claims. Assigned to Canadian International Paper Company. [Cl. 53-150]

Crimping elements rotate about the same shaft as one of the supporting rolls in this device for wrapping large rolls of paper such as newsprint. The elliptically shaped elements engage the extended roll wrapper and flatten out each crimped section in turn as the roll is rotated. 5 figures. W.B.W.

FLEISCHER, LEO S., and TACKENBERG, RICHARD C. Wrapping and packaging machine. U. S. patent 2,673,430. Filed June 18, 1949. Issued March 30, 1954. 2 claims. Assigned to The Crystal Tissue Company. [Cl. 53-84]

Flat articles capable of passing between compressive rolls (e.g., pads of napkins) are fed between an upper and lower web of cellophane, waxed paper, or other heat-sealable material, and the webs are sealed together on all sides of each article. Individual packages are severed through the sealed portion of the web, and the edges are folded over and heat sealed to the top of the package. 13 figures. W.B.W.

HAW, JOHN O. Packaging apparatus. U. S. patent 2,673,432. Filed Nov. 8, 1952. Issued March 30, 1954. 3 claims. Assigned to E. I. du Pont de Nemours and Company. [Cl. 53-105]

Cakes of rayon yarn are supported on the platform of a hand-operated device, while a tube of porous paper fed from a supply roll is passed through the center opening of the cake; the tube is then turned inside out, covering the yarn cake. Removal of the cake from the platform and folding the paper over the exposed shoulder complete the wrapping operation. 6 figures. W.B.W.

RIEBE, EDWARD J. Apparatus for forming and wrapping products. U. S. patent 2,673,429. Filed July 26, 1950. Issued March 30, 1954. 3 claims. [Cl. 53-56]

Pats of butter are cut from a quarter-pound bar and wrapped in a strip of paper fed from a supply roll on the machine. Each pat is of uniform size and individually wrapped to eliminate waste and provide sanitary handling. 18 figures. W.B.W.

RUSSELL, ALEXANDER, HOPTON, ALAN, and CARTER, ARTHUR F. Wrapping machine. U. S. patent 2,672,717. Filed April 3, 1951. Issued March 23, 1954. 25 claims. Assigned to The Forgrove Machinery Company Limited. [Cl. 53-41]

Stacks of biscuits or the like are delivered by a compartmented conveyor to the wrapping wheel of the machine, which is adjustable to fold the wrapper around items of various shapes. Heat-sealable materials may be used, or the wrapper may consist of a parchment paper, in which case adhesive is applied to form the seal. 31 figures. W.B.W.

MACHINERY—PASTING MACHINE

KINDSETH, HAROLD V. Pasting mechanism for bag closing and sealing machines. Canadian patent 500,481. Filed Oct. 12, 1951. Issued March 9, 1954. 12 claims. Assigned to Bemis Bro. Bag Co.

A mechanism for impinging liquid adhesive upon the surface of the bag wall without disturbing it is claimed. This is the same as U. S. patent 2,642,309 (Jan. 6, 1953); *cf.* B.I.P.C. 23: 457. 11 figures. W.B.W.

MACHINERY—PRESSES

HORNBOSTEL, LLOYD. Suction press assembly. U. S. patent 2,672,078. Filed April 5, 1950. Issued March 16, 1954. 5 claims. Assigned to Beloit Iron Works. [Cl. 92-49]

The pickup felt in a reverse press assembly removes the web from the

wire and carries it to the first suction-press nip, where it is protected by felts on both sides, after which the web is conducted through two more nips as it is transferred to the second and third felts. Suction is applied from alternate sides of the web, and the press rolls are urged against the suction rolls by fluid pressure applied through diaphragms. The second reverse-press nip is substantially vertical to aid in water removal and the transfer of the web to the press roll. 1 figure. W.B.W.

MACHINERY—PULPERS

FRASER, DOUGLAS. Machine for treating paper mill waste. U. S. patent 2,672,075. Filed Feb. 20, 1950. Issued March 16, 1954. 4 claims. [Cl. 92-20]

A pulper for treatment of broke, esparto grass, or straw comprises a vat with projecting brackets mounted on the walls and a vertical driven shaft from which drag bars radiate to co-operate with the wall-mounted brackets. The bottom of the vat is made up of perforated plates (slidably adjustable for opening size) through which the defibered material passes, as well as the dirt and grit. A dirt trap, immediately below the plates, removes the material from the accepted stock. 5 figures. W.B.W.

MACHINERY—SCREENS

WALTERS, THEODORE M. Centrifugal pulp cleaning and screening apparatus. U. S. patent 2,672,238. Filed May 14, 1952. Issued March 16, 1954. 6 claims. [Cl. 210-67]

A rotating cylindrical slotted screen disposed vertically within an outer vat receives the pulp slurry in an interconnected pair of slotted tubes with valves located in the bottom thereof for periodic removal of grit and large particles that settle to the bottom of the tubes. Slots in the screen wall are wedge-shaped with the wide side toward the interior of the screen. A spray tube, located outside the screen wall and fitted with a number of nozzles, reciprocates vertically to clean the entire outer wall of the screen effectively. Accepted stock is removed through a conduit in the bottom wall of the outer vat outside the screen, and the rejected stock is removed through a conduit in the bottom wall inside the screen. 12 figures. W.B.W.

MACHINERY—SHEET-FEEDING MECHANISM

BACH, JOHN W. Sheet feed control device. U. S. patent 2,670,954. Filed March 9, 1951. Issued March 2, 1954. 14 claims. Assigned to Pitney-Bowes, Inc. [Cl. 271-57]

Sheets are fed from a shingled, forwardly advancing stack into the nip between a feed roll and an adjustable sensing roll. If more than one sheet enters the nip, the sensing element closes a switch which acts to engage a pawl in the feed roll, thereby stopping that roll instantly and allowing the shaft to continue rotation through the clutch unit. A minimum amount of the operator's time is required to remove the offending sheets and restart the machine. 6 figures. W.B.W.

MACHINERY—SHOWERS

DUNN, JOHN R. Shower for pulp washers. U. S. patent 2,673,763. Filed Jan. 26, 1953. Issued March 30, 1954. 3 claims. Assigned to Canadian International Paper Company. [Cl. 299-121]

A shower pipe slotted almost continuously across the width of the washer drum and fitted with an internal baffle to separate the slotted portion from the remainder of the pipe is claimed. Holes are drilled along the length of the baffle so that an even distribution of water is provided across the entire slotted portion of the pipe. The deflector plate is fastened directly to the shower pipe; it may be feathered from the bottom to make a knife-edge lip for passage of the sheet of wash water. 4 figures. W.B.W.

MACHINERY—SLITTERS AND WINDERS

HUCK, WILLIAM F. Tensioning mechanism for moving webs. U. S. patent 2,670,907. Filed Aug. 25, 1947. Issued March 2, 1954. 3 claims. Assigned to Huck Co. [Cl. 242-75]

A variable-diameter pulley, interconnected with the driving means of this device, tends to force the friction belt that rides on the roll surface to assume a slightly slower speed than the true speed of the web leaving the roll. The unit may also be used for winding by reversal of an idler pulley from one side to the other of the driving belt with a consequent reversal of the idler roll sensing element that determines the web tension. 3 figures. W.B.W.

KURLINSKI, BERNARD J. Rewind core spacer. U. S. patent 2,671,618. Filed March 15, 1952. Issued March 9, 1954. 2 claims. [Cl. 242-68]

The spacers claimed for the rewind shaft of a duplex-type rewinder are made from metal, plastic, or similar material and are readily adjustable without use of tools. A spacer is slipped on each shaft between cores to insure accurate positioning on the shaft. 2 figures. W.B.W.

MACHINERY—VATS

VIGER, AVENON S. Attachment to machines for forming pulp. U. S. patent 2,672,077. Filed April 18, 1952. Issued March 16, 1954. 6 claims. Assigned to Lamb-Grays Harbor Company. [Cl. 92-43]

The drip trough under a dewatering roll (associated with a cylinder mold of a pulp washing or wet-lap machine) is supported by rupturable means, and the dewatering roll is mounted pivotally to allow passage of the drip trough between the dewatering roll and the cylinder mold in the event that it is dislodged by a pulp mass. 3 figures. W.B.W.

MATERIALS HANDLING

JOHANSSON, ERIK, BERGVALL, BERTIL, and ALFREDSSON, UNO. Mechanism for separating of sheet-like materials. Canadian patent 500,275. Filed July 11, 1950. Issued March 2, 1954. 5 claims. Assigned to Aktiebolaget Svenska Fläktfabriken.

Superimposed sheets of hardboard leaving the tempering chamber are separated by this mechanism which utilizes radially projecting arms on a shaft to engage the upper sheet of a pair delivered to a flat table by a conveyor and force it between the nip of rolls which feed the sheet onto a second conveyor. After a timed interval, the first conveyor resumes operation and feeds the lower board onto the second conveyor. 2 figures. W.B.W.

MOLDED PULP ARTICLES

RISCH, ARTHUR H. Molded pulp pallet support. U. S. patent 2,673,052. Filed Dec. 14, 1950. Issued March 23, 1954. 6 claims. Assigned to Pulp Reproduction Company. [Cl. 248-120]

Improved expendable molded-pulp pallet supports are constructed of various shapes with concentric inner and outer walls, the latter of which may be ribbed or fluted to provide additional strength. 7 figures. R.A.S.

PACKAGING

BAXTER, THOMAS R. Package. U. S. patent 2,672,233. Filed Nov. 30, 1949. Issued March 16, 1954. 1 claim. Assigned to Continental Can Company, Inc. [Cl. 206-57]

A package of folded cellulosic cleansing tissues of a size adapted to be carried in a pocket or handbag is made of a continuous film material, preferably polyethylene, and a cardboard base sheet. Individual tissues are withdrawn through a slot which may be opened along a weakened line or by a tear strip. 6 figures. R.A.S.

COLGREN, CARL T. Package of stacked receptacles. U. S. patent 2,672,981. Filed Sept. 8, 1947. Issued March 23, 1954. 9 claims. Assigned to Sutherland Paper Company. [Cl. 206-65]

A package of stacked paper cups is wrapped in a heat-sealable transparent wrapper, and a label is enclosed within and supported in position by the wrapper. This is the same as Canadian patent 481,712 (March 11, 1952); *cf.* B.I.P.C. 22: 714. 5 figures. R.A.S.

GILL, WILLIE, and NICHOLSON, SAMUEL S. Shipping package. Canadian patent 500,279. Filed July 16, 1952. Issued March 2, 1954. 8 claims. Assigned to American Can Company.

This is identical with U. S. patent 2,662,649 (Dec. 15, 1953); *cf.* B.I.P.C. 24: 508. 10 figures. R.A.S.

KENDRICK, MARRON. Package for lock sets. U. S. patent 2,670,892. Filed Aug. 18, 1950. Issued March 2, 1954. 3 claims. Assigned to Schlage Lock Company. [Cl. 229-15]

Packaging means for lock sets which comprise two main elements consist of two identical interior trapezoidal containers and an outer rectangular carton made from paperboard. The outer carton is provided with slotted locking flaps. 6 figures. R.A.S.

VANDER LUGT, THOMAS, JR. Collapsible partitioned display carton. U. S. patent 2,673,023. Filed June 29, 1953. Issued March 23, 1954. 8 claims. Assigned to Sutherland Paper Company. [Cl. 229-41]

A collapsible partitioned paperboard carton is formed of an integral sheet cut and scored to provide a bottom and a rear wall, two end walls, two partitions, and a portion of the front wall between the partitions. A transparent overwrap completes the package. 7 figures. R.A.S.

VOGT, CLARENCE W. Commodity package. U. S. patent 2,671,731. Filed April 12, 1950. Issued March 9, 1954. 5 claims. [Cl. 99-171]

Individual units (such as quarter-pound bars of butter or margarine) are wrapped in a protective printed cover, preferably a laminated material comprising parchment and a waxed sheet or film. A sealing band, perforated to correspond to the width of the units, is applied over the bottom and ends of a desired number of units, thereby eliminating a separate carton. The customer separates the number of sticks wanted from the larger package displayed by the retailer. 6 figures. W.B.W.

PAPER—COATED

BAULING, ADRIANUS L., and MILNE, DAVID T. Process for rendering films and the like water-repellent, greaseproof, and moistureproof. U. S. patent 2,672,427. Filed May 26, 1951. Issued March 16, 1954. 19 claims. Assigned to American Viscose Corporation. [Cl. 117-140]

A process for treating films, paper, fiberboard, or fabrics to make them greaseproof and waterproof is claimed. In an example, an aqueous emulsion containing paraffin and sodium carboxymethylcellulose together with a plasticized melamine-formaldehyde resin is applied in a bath, the excess doctored from the surface, a spray of hydrated aluminum sulfate applied, and the film rinsed with water, dried, and heated at 121°C. for three minutes to cure the resin. W.B.W.

ERTNER, EDWARD W. Apparatus for coating webs, including adjustable doctor blade. U. S. patent 2,672,119. Filed Aug. 23, 1951. Issued March 16, 1954. 7 claims. Assigned to Western Electric Company, Incorporated. [Cl. 118-118]

The coating device covered by this patent is adapted to the application of a lacquer to a portion of one side of a web, the edge portions being left uncovered. Excess lacquer is scraped from the doctor roll and redistributed to adjustable pins in the doctor-roll support, from which it is metered onto the doctor roll for application to the uncoated edges. A coating of uniform thickness across the entire width of the web is claimed. 4 figures. W.B.W.

KLEIN, DAVID X., and CURGAN, MARK N. Composition comprising a polyvinyl chloride resin, a plasticizer and a viscosity controlling agent. U. S. patent 2,657,186. Filed Oct. 12, 1949. Issued Oct. 27, 1953. 8 claims. Assigned to Heyden Chemical Corporation. [Cl. 260-23]

Fatty acid esters of polyoxyalkylenes reduce the viscosity of polyvinyl chloride resin compositions sufficiently to permit spraying, knife-coating, etc. of these materials as a continuous film to the surface of paper, fabrics, or metal foil without the disadvantages inherent in the use of solvents for this purpose. W.B.W.

SIGNER, RALPH J., and BEAL, KEITH F. Mixture of polychloroprene, vinyl chloride polymer, and butadiene-acrylonitrile copolymer. U. S. patent 2,658,050. Filed June 8, 1950. Issued Nov. 3, 1953. 14 claims. Assigned to The Visking Corporation. [Cl. 260-45.5]

A synthetic resin composition useful as a coating agent for paper, fabric, or metal foil, as a cement for sealing polyvinylidene, or as a transparent thermoplastic heat-sealable film is made by mixing polychloroprene and a vinyl chloride-vinyl acetate copolymer in a suitable solvent and with a blending agent such as butadiene-acrylonitrile copolymer. W.B.W.

PAPER—COATED (HOT-MELT)

HORBACK, WILLIAM. Hot-melt coating composition. Canadian patent 500,821. Filed Oct. 30, 1947. Issued March 16, 1954. 2 claims. Assigned to Camille Dreyfus.

A heat-sealing, moistureproof, hot-melt coating composition for wood, paper, or metal comprises cellulose propionate, dibutyl sebacate, and butoxyethyl stearate. This corresponds to U. S. patent 2,510,177 (June 6, 1950); *cf.* B.I.P.C. 20: 835. W.B.W.

PAPER CONDITIONING

FLINT, EUGENE M. Apparatus for treating flexible webs. U. S. patent 2,672,844. Filed June 21, 1951. Issued March 23, 1954. 4 claims. Assigned to Vapo Systems Company. [Cl. 118-315]

An apparatus for application of a conditioning fluid to a moving web embodies a supply and return line for the liquid material and a supply line for compressed air to the atomizing nozzles. The fluid return line makes possible a close control of solids content, temperature, or other variables. 8 figures. W.B.W.

PAPER SPECIALTIES

AMBERG, WALTER E., and AMBERG, STEPHEN W. Method of forming truncated conical paper cups. U. S. patent 2,673,496. Filed Feb. 9, 1950. Issued March 30, 1954. 8 claims. Assigned to Lily-Tulip Cup Corporation. [Cl. 93-36]

The apexial end of a conical paper cup is pleated and compressed to a rounded, spoon-serviceable bottom suitable for soda fountain or similar use. 8 figures. W.B.W.

BIGLEY, MILES G. Manufacture of tar paper. Canadian patent 500,534. Filed July 15, 1946. Issued March 9, 1954. 4 claims. Assigned to Koppers Company, Inc.

The process and equipment for saturating building paper with coke-oven tar are claimed. This corresponds to U. S. patent 2,637,660 (May 5, 1953); *cf.* B.I.P.C. 23: 775. 3 figures. W.B.W.

BRADY, CHARLES V., and OTTINGER, AUGUST F. Bag. Canadian patent 500,872. Filed Sept. 1, 1949. Issued March 23, 1954. 21 claims. Assigned to Bemis Bro. Bag Company.

An open-mesh bag incorporates a relatively large area of kraft or creped paper to receive printing. This corresponds to U. S. patent 2,565,754 (Aug. 28, 1951); *cf.* B.I.P.C. 22: 154. 19 figures. W.B.W.

CLARK, GEORGE R., and MILLER, LLOYD F. Light-sensitive baryta-coated photographic paper. Canadian patent 500,663. Filed Sept. 8, 1949. Issued March 16, 1954. 1 claim. Assigned to Canadian Kodak Company Limited.

The use of glyoxal as the gelatin-hardening agent in a gelatino-baryta coating composition is claimed to produce a more uniform coating without the disadvantages of irritating fumes attendant upon the use of formaldehyde for this purpose. 3 figures. W.B.W.

CUNDER, JOSEPH, and LICATA, FRANCIS J. Water-dispersible metal soap compositions. U. S. patent 2,660,567. Filed Dec. 11, 1947. Issued Nov. 24, 1953. 20 claims. Assigned to Nopco Chemical Company. [Cl. 252-311]

Metal soap compositions (useful for waterproofing textiles, leather, paper, concrete, etc.) prepared in the dry form and readily dispersible in water are formed by mixing the pulverulent metal soap with an alkylolamide. W.B.W.

DEUTSCHMEISTER, HERMAN, and DEUTSCHMEISTER, ABRAHAM. Two-way mailing device. U. S. patent 2,673,680. Filed April 4, 1950. Issued March 30, 1954. 3 claims. [Cl. 229-73]

A sheet of paper is suitably cut, scored, and gummed to provide a semi-sealed envelope for mailing in one direction and a completely sealed return envelope. 5 figures. R.A.S.

DWORAK, JOSEPH R., and BUSCH, RUDOLPH H. Saucer pad. U. S. patent 2,670,615. Filed Oct. 6, 1950. Issued March 2, 1954. 1 claim. [Cl. 65-16]

A saucer-pad and cup-cover combination comprises one or more plies of absorbent paper secured by adhesive to a bottom layer of metal foil; this circular body is depressed with two concentric rings to receive either the bottom or the top of a conventional cup. 3 figures. R.A.S.

GOLDSTEIN, NATHAN, and SCHERR, HENRY J. Paper parasol. U. S. patent 2,671,458. Filed Sept. 3, 1948. Issued March 9, 1954. 2 claims. [Cl. 135-20]

A toy paper parasol comprises a tubular cardboard handle, a circular cover of decorative paper, and a cardboard rib structure made from either one rectangular blank or two blanks stapled together and slit to form struts which are fastened to the cover and slidably engage the handle. 11 figures. R.A.S.

HOEPPNER, ARTHUR D., and HAYES, RICHARD. Bag construction. Canadian patent 501,076. Filed Aug. 3, 1951. Issued March 30, 1954. 1 claim. Assigned to Bemis Bro. Bag Co.

The rear wall is folded over the front wall to form a combination closure and handle for the bag. This is very similar to U. S. patent 2,620,842 (Dec. 9, 1952); *cf.* B.I.P.C. 23: 376-7. 6 figures. W.B.W.

KUSS, RALPH L. Flat bottomed tubular container. U. S. patent 2,673,024. Filed June 11, 1951. Issued March 23, 1954. 1 claim. [Cl. 229-57]

A bag or liner of rectangular or hexagonal shape, made from sheet material, involves end flaps cut to fit with overlap on only one side so that no more than two thicknesses exist at any seam; extra material is allowed at the corners of the bottom to prevent breakage when the container is filled with liquids or solids. 22 figures. R.A.S.

MCPARTLAND, EDWARD T. Disposable umbrella for emergency use. U. S. patent 2,672,877. Filed Feb. 3, 1950. Issued March 23, 1954. 2 claims. [Cl. 135-19.5]

An umbrella constructed from waterproof paper or cardboard, celluloid, plastics, or sheet aluminum which is readily foldable to compact proportions comprises a circular canopy with fold lines and a handle strap of similar material stapled at both ends near the center of the canopy. The insertion of the fingers between the handle and the canopy will bow both elements. 21 figures. R.A.S.

NEUGEBAUER, WILHELM, TOMANEK, MARTHA, and BÖTTGER, HANS. Light-sensitive diazotype material. U. S. patent 2,672,418. Filed Jan. 4, 1951. Issued March 16, 1954. 7 claims. Assigned to Keuffel & Esser Co. [Cl. 95-6]

Photosensitive materials characterized by good contrast and ability to withstand storage are prepared by the application of a solution containing the zinc chloride double salt of 1-amino-4-N,N-di-n-propylamino-benzene as the diazo compound and 2,3-dihydroxy-naphthalene-6-sulfonic acid or its salts as azo coupling components to a paper or cellulose acetate base sheet. W.B.W.

ROSENBLUM, CARL. Nonsmudging transfer sheet. U. S. patent 2,671,734. Filed March 25, 1949. Issued March 9, 1954. 3 claims. Assigned to Rose Ribbon & Carbon Mfg. Co., Inc. [Cl. 117-36]

By incorporating bronze powders with "leafing" properties into different waxes (beeswax, paraffin, candelilla, carnauba, etc.) or ethylcellulose, an antismudge coating is obtained which is flexible and easily ruptured under impact. No chemical action between the ingredients of the film or diffusion between contacting layers takes place. 1 figure. W.B.W.

SCHUR, MILTON O., and LEVY, ROBERT M. Cigarette paper. U. S. patent 2,673,565. Filed Nov. 9, 1951. Issued March 30, 1954. 2 claims. Assigned to Ecusta Paper Corporation. [Cl. 131-15]

The ashing properties of cigarette paper treated with ammonium phosphate are claimed to be improved by the addition of at least 0.1% of magnesium carbonate to the furnish, thus eliminating the use of phosphoric acid in the manufacturing process with the attendant difficulties of corrosion, scale formation, etc. W.B.W.

SCHUR, MILTON O., and LEVY, ROBERT M. Method of producing cigarette paper. U. S. patent 2,673,799. Filed Sept. 25, 1952. Issued March 30, 1954. 2 claims. Assigned to Ecusta Paper Corporation. [Cl. 92-21]

This is very similar to U. S. patent 2,673,565 (March 30, 1954); *cf.* abstract above. W.B.W.

VOGT, CLARENCE W. Chain of bags. U. S. patent 2,671,602. Filed Sept. 4, 1948. Issued March 9, 1954. 8 claims. [Cl. 229-53]

Bags with a closure flap are fastened in a chain with thermoplastic adhesive, and the flap of one bag is sealed to the bottom edge of the preceding bag; the bags are likewise joined in pairs back-to-back with a short tab. After filling, the seals are released and the bags handled as units. 3 figures. W.B.W.

WALSH, ROBERT A. Improvement in label and label protector.

U. S. patent 2,671,678. Filed Feb. 20, 1950. Issued March 9, 1954. 1 claim. [Cl. 282-27]

The label claimed is coated on the reverse side with a duplicating substance and attached at one edge to a sheet of flexible transparent material which is adhesively coated on the marginal portions. When the label is in place, the transparent sheet is folded over the label and seals the label within a protective pocket. 4 figures. W.B.W.

PAPER SPLICING

TOLLISON, PAUL L. Web roll accelerating apparatus. Canadian patent 500,577. Filed Dec. 19, 1949. Issued March 9, 1954. 11 claims. Assigned to Wood Newspaper Machinery Corporation.

A fresh roll of paper is brought up to splicing speed regardless of roll size or speed of the web. This is identical with U. S. patent 2,601,071 (June 17, 1952); *cf.* B.I.P.C. 22: 884-5. 10 figures. W.B.W.

PHYSICAL TESTING—MOISTURE

MORELOCK, OLIVER J. Moisture testing apparatus. U. S. patent 2,673,327. Filed March 15, 1952. Issued March 23, 1954. 2 claims. Assigned to Weston Electrical Instrument Corporation. [Cl. 324-65]

Materials to be tested for moisture content such as grains or seeds are passed between driven fluted rolls electrically insulated from each other. The conductivity of the materials between the rolls is determined by measuring the resistance of the instrument circuit with a suitably calibrated meter. A range-selector switch is provided to change the full-scale sensitivity of the instrument. 1 figure. W.B.W.

PLASTICS

SWEENEY, ORLAND R., ARNOLD, LIONEL K., and LONG, JUSTIN T. Plastic from furfural and lignin or lignin sulfonic acid. U. S. patent 2,671,061. Filed Jan. 24, 1951. Issued March 2, 1954. 10 claims. Assigned to Iowa State College Research Foundation, Inc. [Cl. 260-17.5]

Furfural mixed with an aromatic amine and lignosulfonic acid to which an acidic condensing agent is added polymerizes to produce plastic materials which will harden at 18-100°C. and under atmospheric pressure. The material is useful for the formation of chemically resistant tanks, piping, pumps, etc. W.B.W.

PRINTING AND PRINTER'S INK

BAINBRIDGE, JOHN P., JR. Preventing offset of print from freshly printed papers. U. S. patent 2,673,520. Filed Feb. 9, 1948. Issued March 30, 1954. 5 claims. Assigned to Monsanto Chemical Company. [Cl. 101-416]

A spray or mist containing from 1 to 20% silica by weight in the form of particles less than one micron in diameter is claimed to prevent offset in the stacking or rewinding of freshly printed paper. W.B.W.

RAYON—CUPRAMMONIUM PROCESS

TSUNODA, YOSHIO. Process for making cupro-ammonium rayon spinning solution. U. S. patent 2,673,811. Filed Sept. 29, 1950. Issued March 30, 1954. 2 claims. Assigned to Asahi Kasei Kogyo Kabushiki-Kaisha. [Cl. 106-167]

The use of supersonic vibrations at 15 kc. (5 to 20 watts/sq. cm. of vibrator cross section) is claimed to aid in the dissolving of cotton linters in cuprammonium solution. Rayon yarn and staple fiber made from a solution so treated show good friction resistance and absorb an adequate amount of dyestuff. 1 figure. W.B.W.

SATIN WHITE

THOMPSON, RALPH N. Method of dispersing satin white. U. S. patent 2,671,032. Filed March 4, 1950. Issued March 2, 1954. 4 claims. Assigned to Calgon, Incorporated. [Cl. 106-306]

Satin white is made readily dispersible by the addition of 1-12% of protein of animal or vegetable origin (e.g., casein or soybean protein) and from 0.1 to 3% of an alkali metal phosphate (percentages based on weight of dry satin white). Adhesive demands in the coatings prepared with satin white dispersed in the above manner are claimed to be markedly reduced. W.B.W.

SETUP BOXES

LALIBERTÉ, RENÉ. Soap box. Canadian patent 501,212. Filed June 28, 1950. Issued April 6, 1954. 1 claim. [In French]

A rectangular soap box involving a tray and sleeve is claimed. 5 figures. E.S.

SHIPPING CONTAINERS

LEAVITT, JAMES P. H. Shipping container. U. S. patent 2,671,597. Filed June 22, 1949. Issued March 9, 1954. 3 claims. Assigned to Container Corporation of America. [Cl. 229-14]

A shipping container formed of corrugated board, solid fiberboard, or the like comprises an open-ended liner and two identical cover sections with an interior cap forming a double-closure top. The cover sections telescope over the liner until the edges are flush; adhesive tape is used to secure these edges together. 9 figures. R.A.S.

LEAVITT, JAMES P. H. Shipping container. U. S. patent 2,671,600. Filed Oct. 25, 1949. Issued March 9, 1954. 2 claims. Assigned to Container Corporation of America. [Cl. 229-23]

Top and bottom sections, each with a tray-shaped reinforcing member at the closed end, telescope over a liner with a foldable front section to form an easily packed container for textiles and like materials. 7 figures. R.A.S.

LEAVITT, JAMES P. H. Shipping container. U. S. patent 2,671,601. Filed Oct. 25, 1949. Issued March 9, 1954. 1 claim. Assigned to Container Corporation of America. [Cl. 229-23]

A telescoping paperboard shipping container comprises an inner liner for

three walls, a liner section for the fourth wall and the bottom (the top wall section of which may be bent outwardly downward to facilitate packing), two four-walled outer sections which telescope over the liner, and two tray-type outer covers for the top and bottom. The telescoping sections each comprise shorter and longer walls which meet flush in a staggered line. 7 figures. R.A.S.

MILLER, ANDREW E. Chick box cleat. U. S. patent 2,671,594. Filed Oct. 7, 1948. Issued March 9, 1954. 1 claim. Assigned to Alton Box Board Company. [Cl. 229-6]

A spacing cleat particularly for shipping boxes for baby chicks is formed by laminating several thicknesses of corrugated board, arranged so that the corrugations extend heightwise and cut to form a T-tenon. Slots in the box cover receive the cleats crosswise at the four corners and in the center. 5 figures. R.A.S.

MILLER, ANDREW E. Chick box cleat. U. S. patent 2,671,595. Filed Sept. 28, 1951. Issued March 9, 1954. 2 claims. Assigned to Alton Box Board Company. [Cl. 229-6]

Spacing cleats, T-shaped in side elevation, are held secure by the flaps of I-shaped slots cut crosswise on each corner of a shipping box for baby chicks. 8 figures. R.A.S.

MORTON, WOOLRIDGE B. Packing case. U. S. patent 2,673,678. Filed Aug. 17, 1949. Issued March 30, 1954. 3 claims. Assigned to Wilbro Corporation. [Cl. 229-37]

A conventional fiberboard packing case is adapted for shipment of perishable or fragile articles by reinforcement so the case will withstand high stacking. Longitudinal score lines are made at the corners and on each side, a short distance from and parallel to the corner. This area at each corner is impregnated with a water-impervious thermosetting resin; the sides of the flaps may also be treated. 4 figures. R.A.S.

PROSSEN, LOUIS F. Carton. Canadian patent 500,492. Filed Nov. 13, 1950. Issued March 9, 1954. 9 claims. Assigned to Celanese Corporation of America. U. S. patent 2,673,022. Filed Jan. 4, 1950. Issued March 23, 1954. 3 claims. Assigned to Celanese Corporation of America. [Cl. 229-15]

A corrugated paper carton with a palletized base for shipping and storage of dry bulk material is described. Two cross partitions divide the carton into four equal cells, each of which is further partitioned diagonally, with the partitions secured to the midpoint of each wall by stapling or stitching. A cover with closure flaps telescopes over the upper half of the carton. 2 figures. R.A.S.

ROSEN, JOHN. Corrugated board box construction. U. S. patent 2,671,598. Filed Aug. 23, 1950. Issued March 9, 1954. 2 claims. [Cl. 229-15]

A box construction of fiberboard, corrugated cardboard, or similar sheet material comprises five separable elements—a main outer open-top carton with a three-ply bottom, two identical sections with three walls which fit within the outer carton, and two pieces which form the central partition and the cover for half of the carton. 10 figures. R.A.S.

SHIPPING CONTAINERS—FIBER DRUMS

PAGE, JOHN E. Collapsible container. U. S. patent 2,671,592. Filed May 26, 1951. Issued March 9, 1954. 3 claims. Assigned to Gibson Patent Containers, Ltd. [Cl. 229-5.7]

A collapsible tubular body is formed from inexpensive paperboard with a core made from waste paper or newsprint laminated between paper facing sheets. Bottom and top closure disks are held by a thin circular rim of sheet metal with an inturned lip wedge locking with the container to provide a substantially leakproof construction. 22 figures. R.A.S.

PAGE, JOHN E. Paperboard container. U. S. patent 2,671,593. Filed Feb. 7, 1952. Issued March 9, 1954. 5 claims. Assigned to Gibson Patent Containers, Ltd. [Cl. 229-5.7]

In a construction similar to U. S. patent 2,671,592 (March 9, 1954; *cf.* abstract above), the upper edge of the container is beaded to receive the metal or plastic rim after the top disk has been removed, thereby preventing the collapse of the container side walls. 20 figures. R.A.S.

SILICATE OF SODA

LANDER, JAMES G. Method of preventing adhesion. U. S. patent 2,671,747. Filed March 11, 1950. Issued March 9, 1954. 3 claims. Assigned to Diamond Alkali Company. [Cl. 154-138]

The adhesion of sodium silicate to platens and rolls of laminating machinery is claimed to be eliminated by the application of a coating, a mixture containing 8% urea, 0.2% triethanolamine, and the remainder sodium silicate with about 37% solids, to the surfaces. W.B.W.

TALL OIL

ESPOSITO, VITO. Treating tall oil with alkylene oxides. Canadian patent 500,346. Filed May 17, 1952. Issued March 2, 1954. 9 claims. Assigned to R. M. Hollingshead Corporation.

Tall oil purified with maleic acid and treated with ethylene oxide is claimed to be suitable for use in hydraulic fluid compositions. This is the same as U. S. patent 2,610,966 (Sept. 16, 1952); *cf.* B.I.P.C. 23: 153. W.B.W.

HARWOOD, JAMES, HOERR, CHARLES W., and RECK, RICHARD A. Separation of tall oil acids. U. S. patent 2,672,458. Filed Feb. 8, 1952. Issued March 16, 1954. 11 claims. Assigned to Armour and Company. [Cl. 260-97.6]

The use of acetonitrile with closely controlled amounts of water at room temperature is claimed to afford a means of separating the resin acids from the fatty acids in tall oil. The bulk of the resin acids is precipitated, whereas the fatty acids remain in solution. 7 figures. W.B.W.

TEXTILE INDUSTRY AND FABRICS—FIREPROOFING

LOUKOMSKY, ANNE M., KIENLE, ROY H., and COOKE, THEODORE F. Method of treating fibrous cellulosic materials to impart flame resistance thereto, compositions therefor and products thereof. Canadian patent 501,066. Filed May 12, 1949. Issued

March 30, 1954. 16 claims. Assigned to American Cyanamid Company.

A flameproofing composition especially suitable for natural and regenerated cellulose textile products comprises a mixture of finely divided antimony trioxide, a thermoplastic substance containing combined halogen such as polyvinyl chloride, and a water-soluble salt of phosphorus such as guanidine phosphate. The composition is applied as an aqueous solution and is claimed to form a washfast impregnant which imparts a good feel or hand to the textile. W.B.W.

TEXTILE INDUSTRY AND FABRICS—TESTING

SHAW, MYRIL C. Apparatus for testing the resistance of textile fabric to abrasion, flexing, and creasing. U. S. patent 2,670,627. Filed Feb. 27, 1953. Issued March 2, 1954. 4 claims. Assigned to Asbestos Textile Institute. [Cl. 73-159]

This testing device has been found especially suitable for testing asbestos and other fabrics of heavier grades for wear and crease resistance. Loops of fabric under test are fastened to a cylinder (I) and rotated against a smaller cylinder (II) which is mounted close to (I) with just sufficient clearance to crease the sample as it passes between the two. (II) is also covered with a suitable abrasive material to test the wear resistance of the fabric. 9 figures. W.B.W.

VULCANIZED FIBER

TRIBELHORN, EMILE. Laminated ski. Canadian patent 500,459. Filed May 2, 1951. Issued March 9, 1954. 1 claim.

A laminated wood ski includes two layers of vulcanized fiber in the laminate to increase the resistance to breakage. 10 figures. W.B.W.

WAXES

KNOX, WILLIAM T., JR. Wax composition and process for producing wax. U. S. patent 2,660,553. Filed Feb. 23, 1951. Issued Nov. 24, 1953. 5 claims. Assigned to Standard Oil Development Company. [Cl. 196-17]

A hard flexible wax especially suitable for coating of papers used in food packaging is produced by the catalytic cracking of the gas-oil fraction of crude petroleum, removing the aromatic constituents, and dewaxing the residue, preferably by solvent extraction. 1 figure. W.B.W.

WET STRENGTH

BECHTOLD, MAX F. Process of preparing a homogeneous aqueous colloidal dispersion of silica and a hydrous oxide of zinc, aluminum, tin, or columbium and the resulting product. U. S. patent 2,657,183. Filed Aug. 9, 1949. Issued Oct. 27, 1953. 10 claims. Assigned to E. I. du Pont de Nemours & Company. [Cl. 252-313]

Mixed oxide dispersions of silicon dioxide and an alkali metal zincate, aluminate, stannate, or columbate when passed through a cation-exchange column (which may contain an organic cationic ion exchanger such as lignin) produce a material useful for treating paper to improve wet strength and printing characteristics and snag resistance in textiles. The resulting solutions will remain fluid for at least 26 days according to the claims. W.B.W.

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